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ABSTRACT

Presentations on the changing nature of information services in research libraries in the context of advanced technology are combined with business meeting minutes in this report. The report begins with copies of three papers presented as part of a panel discussion on the program theme together with transcripts of accompanying remarks/discussion. The papers are: (1) "Information Services in the '90s: Competition or Cooperation?" (Robert Weber); (2) "Information Services and the Library: Demands, Resources, and Values for the Future" (Patricia Swanson); and (3) "Roles and Actions for ARL" (Clifford Lynch). Also included are brief reports on group discussions of concerns relating to information needs in science and technology by James Green, Elmer Smith, Robert Zich, and Martin Cummings. An update on serials pricing and library responses to this by Ann Okerson is then presented. Business meeting coverage includes a report of membership dues and reports from the Statistics Committee, the Executive Director, ARL President, and the ARL President-Elect. Concluding these minutes are a report on association activities (May-October 1990); a list of the attending participants; and lists of the officers and members of the Board of Directors, committees, task forces, and member associations of the ARL. (MAB)

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October 24–26, 1990
Washington, D.C.

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Minutes
# of the
117th
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Exploring the Future of Information Services

Minutes of the 117th Meeting

October 24–26, 1990
Washington, D.C.

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MINUTES OF THE 117TH MEETING
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TABLE OF CONTENTS

Foreword v

PROGRAM SESSION I

Introduction
    Martin Runkle, University of Chicago 3
Information Services in the 1990s: Competition or Cooperation?
    Robert Weber, Northeast Consulting Services 5
Information Services and the Library: Demands, Resources, and Values for the Future
    Patricia Swanson, University of Chicago 19

PROGRAM SESSION II

Introduction
    Marilyn Sharrow, University of California-Davis 29
Information Services: Roles and Actions for ARL
    Clifford Lynch, University of California 31

TOWN MEETING DISCUSSIONS

Information Needs in Science and Technology
    James Green, National Space Science Data Center 43
    Elmer Smith, Canada Institute of Scientific and Technical Information 47
    Robert Zich, Library of Congress 50
    Martin Cummings, Council on Library Resources 53
Update on Serials Pricing and Library Responses
    Ann Okerson, ARL Office of Scientific and Academic Publishing 59

BUSINESS MEETING

Membership Dues 69
Statistics Committee Report 71
Report from the Executive Director 72
Remarks by ARL President 75
Remarks by ARL President-Elect 76

APPENDICES

A. Report on Association Activities May-October 1990 79
B. Attendance/Index 101
C. Officers, Board of Directors, Committees, and Task Forces of the Association 113
D. Membership of the Association 117

ASSOCIATION OF RESEARCH LIBRARIES

117TH MEMBERSHIP MEETING

Washington, DC
October 24-26, 1990

EXPLORING THE FUTURE OF INFORMATION SERVICES

Martin Runkle, *Presiding*

FOREWORD

The theme of the 117th membership meeting is the changing nature of information services in research libraries in the context of advanced technology. The development and integration of sophisticated telecommunications, information storage, and computing technologies are shaping an environment in which libraries will face new kinds of information resources and user needs, changing expectations for professional staff, and new options for the design and provision of services, research resources, and facilities.

Dr. Robert Weber presents the opening address. He is a principal in Northeast Consulting Resources, Inc., writes a column for *Publishers Weekly*, and has been a senior technology consultant at Harvard University's Office for Information Technology. Dr. Weber's consulting practice is focused on the relationships among networks, information services, and strategic planning. He has helped implement and extend Future Mapping®, a proprietary planning methodology for modeling alternative future scenarios and for developing an understanding of the forces shaping change. In his talk, "Information Services in the '90s: Competition or Cooperation?," he presents widely divergent "endstates" that reflect different configurations of factors in publishing, standards, scholarly communication, government regulation, technology, global cooperation, and the like. Following his address, directors meet in small groups for discussion of the endstates and the probability of research libraries or their parent institutions having an impact on the outcomes.

The program further focuses on library services in the contexts of the various "endstates." Directors are asked to define the kinds of services that could exist in each case and the administrative and policy issues likely to emerge, and to consider questions of staffing, professional knowledge requirements, organizational structures, budgets, patterns of seeking information, and institutional arrangements.

Moderator Marilyn J. Sharrow, ARL President-Elect, asks participants to draw on ideas from the earlier discussions to analyze local and national strategies for meeting the challenges and conditions identified as most likely, difficult, or necessary. ARL directors identify the relevancy of past ARL strategies and the possible directions for future programs and activities.

Approaches to improved access to and services for scientific and technical literature are being explored by the National Science Foundation, the Library of Congress, and others. What are these options, and what should be the role of research libraries in different types of institutions in planning and implementing such systems? The town meeting discussions, moderated by Jay Lucker, begin with short panel presentations and lead to an open plenary discussion of the issues and possible responses.

Following the panel discussions is a report of a short session on current strategies for coping with rising serial prices, including results of a recent ARL survey of member libraries' activities in that area.

PROGRAM SESSION I

INTRODUCTION

MR. RUNKLE: It is my pleasure to introduce the program moderator today, Patricia Swanson. Pat's entire career as a librarian has been in public services. She spent the last twenty years at the University of Chicago library, where she has been a reference librarian; head of the reference department; and, for the last seven years, Assistant Director for Science Libraries.

Before assuming her present position, she took a year's leave from the University of Chicago to work with the Association of Research Libraries on the public services self-study. For many years, Pat taught reference courses in a seminar on research libraries at the Graduate Library School at the University of Chicago, and she has been a trainer on occasion for OMS training programs.

MS. SWANSON: The theme of today's meeting, "Exploring the Future of Information Services," will be explored in several stages and with considerable breadth. Dr. Robert Weber will present an opening address.

Robert Weber is a principal in Northeast Consulting Resources, Incorporated, in Boston. His consulting practice focuses on the intersection of network information services and strategic planning. It is this combined perspective that makes him particularly valuable as a speaker on information services. In addition, he is a sociologist by training, holding an M.A. and a Ph.D. He is the author of several books and many journal articles, and therefore is a long-time, familiar, and sophisticated user of our libraries, as well as a consultant and commentor on information services.

His consulting practice also focuses on network-based services such as information distribution and electronic publishing. He writes a column for *Publishers Weekly*, and has given plenary addresses to the Society for Scholarly Publishing and the American Institute of Physics, among others. Bob Weber has been a senior technology consultant at Harvard University's Office of Information Technology and a member of the Association of Computing Machinery, the Boston Computer Society, and the American Sociological Association. His recent work has been on a methodology for planning alternative futures and for understanding the forces shaping change. This will be the context of his remarks this morning.

INFORMATION SERVICES IN THE '90s: COMPETITION OR COOPERATION?

Robert Weber
Northeast Consulting Services

I want to explore how various organizations, technology trends, and the needs of the research library community, faculty, and researchers might intersect in the coming decade to shape how you go about your basic activities.

We were running a meeting in Boston about the future of computing and communications, and someone pointed out that this is a very hard time to make purchasing decisions about technology, because there is a lot of change going on. Somebody characterized this as the "year of buying dangerously": whatever technology decision you make is likely to be wrong a year or two from now. I want to discuss some processes and principles and ideas that may help you think about making some fundamental decisions concerning the use of technology in support of scholarship and research. The library community has changed a great deal.

I used to work in a technology organization at Harvard. I introduced myself to the new head of one of the libraries there. He was a very pleasant person; and there was the usual five or ten minutes of chit-chat. Then this person leaned over the table, looked at me very intently, and said, "So, who do you think should worry about information services, librarians or techies?" Without missing a beat I said, "Librarians, of course." At the moment, that seemed to be the only real answer. That is what I believe, actually. I went on to discuss how techies could be useful in building the technological infrastructures that the library community could depend on. In fact, I saw it as a real partnership, at least in principle, with the library community providing direction. We went on to have a very close professional relationship.

That this question could be asked at all is symptomatic of some very real changes that are going on within higher education, especially in research universities and research libraries. As budgets become extremely tight, it is this kind of challenge that you face. As increasing prices for serials and books have to be dealt with, it becomes more and more difficult to prioritize and to think about what role technology should play in particular institutions. I want to talk about some ideas that we have developed in our firm concerning strategic planning and a process called "Future Mapping®," a little bit of which we are going to do today. We are going to ask you to read some descriptions of the future, and participate in some team tasks in which you will address specific questions related to five visions of the future.

One of the problems of worrying about the future is that the most likely future is only slightly more probable than any other future. If it took some sequence of events to occur, each of which was highly probable, say ninety percent likely, the likelihood of arriving at some future point is not very different from the probability of arriving at any other point. Contingency, therefore, is one of the major issues that planning has to take into account. When you think about the future, you do so because all of us have in our heads a mental model of how the world works, which people who are leaders in your institutions have built up over a long period of time. You all deeply trust these models. They are very important to you, after all, they got you where you are. They are rarely shared. They are so intuitive that you seldom think about them, yet these mental models form the context of your decisions.

I want to explain how to explore your mental models and to expand them, to think about some alternatives. You may arrive at the same decisions, but you may feel that the decisions were based upon a broader, more careful, and comprehensive consideration of the issues. It is interesting that for many hundreds of years, libraries haven't changed as the repository of the culture of society. Libraries perform a very fundamental role in terms of preserving collective memory, yet from a planning standpoint, the accelerating pace of technological change means that you have a shorter period of time in which to make decisions, given the same amount of change. We all need to learn how to react more quickly as the pace of change increases.

The management challenges of the 1990s concern how fast one can learn, and how fast one can adjust mental models to the way the world is changing. You, personally, may have visions that are truly wonderful, but how do you go about communicating that to the people who work with you? How do you get the organization to change its views and positions? There is perhaps a contradiction of sorts in that what you manage is in part the organizational culture which is a process for preserving collective memory, yet you and your organization also have to learn how to forget. The knowledge and information that served you very well earlier is less relevant today. As the context in which you make decisions changes rapidly, forgetting less relevant knowledge is difficult.

I do not believe in a Calvinist model of the future: events are not predestined. As a matter of fact, I believe quite strongly that the future is shaped by various participants as processes unfold. Another way to think about my remarks is to question how you can influence the context in which technology is utilized in higher education and research. The future is the outcome of a series of events, and those events are influenceable by the actors involved. So, for example, if we want to get to some specific future, there are a lot of alternative paths, only one or a few of which lead to the desired outcome. How do you choose among different visions and different paths? What about events that need to happen to get there, but don't happen? What happens if you are blocked, if the NREN is not passed, for example? There is a lot of contingency in the world. The methodology that I have been describing is really a way of analyzing event sequences that show how alternative scenarios for the future develop. We sometimes refer to Future Mapping® as a method for contingency planning. There is no one single vision, and there is no one single path.

Our basic assumption is that the future is shaped by your choices and by your actions, and that changes in various structural variables, changes in technology, changes in funding, changes in outside support, changes in library patron requirements, and so on, offer you opportunity in addition to offering you threats. We are going to work principally with the notion of endstates. An endstate is a snapshot of the future, in this case the future of research libraries.

An event is something that can be influenced. When we do the "Future of Computing" seminar, people say, "What about an earthquake in Silicon Valley?" That is an interesting event and has a lot of consequences, but we tend not to put that in our event database because there is nothing anybody can do to cause or prevent it. There are many important events that are not influenceable that affect the context in which you make critical decisions. We want to talk about things that you can control or influence.

A scenario is a sequence of specific, actionable events that lead to a desired outcome. When we look at four or five or six endstates, we analyze how different event sequences lead to different outcomes. We also analyze the critical events, those that really make the difference in how the world turns out.

People ask, "Why work with endstates?" I'm sure there are 119 very different opinions in this room about what the future of research libraries is likely to be. Each of you has your own vision of the future, and we work with endstates because we want to capture this diversity of opinion. The endstates reveal very important differences in technology, organizational behavior, and goals for the library community. Our endstates are written with the point of view of the end of the decade, the year 2000.

Events can be influenced, and when we write events, we have a title, a date, and a description. In traditional strategic planning engagements, you often hear about issues and trends. For example, one trend is the well-known declining cost of computing. But understanding trends is not particularly useful here because what would you do, knowing that the cost of computing power is declining? What policy or actionable item does that lead you to? However, imagine that in 1994 there will be a color Macintosh computer with eight megabytes of memory equivalent to today's Mac II for $1,000? Now that is an interesting price point. You might begin to wonder in 1994 how it would affect the way you go about making computing and information resources available to patrons. This event reflects an underlying trend, but it makes the trend concrete in a way that you can do something useful with it.

When we do these strategic planning exercises, we end up with a database of about 180 events, each analogous to the inexpensive color Mac II in the 1994 event. There is a very important road sign analogy. If you drive out to the airport, and you are trying to find the place to be dropped off to catch your plane, you need to pay attention to the airline signs. This is important information for you.

Sometimes if you are driving along, and there is a billboard for cigarettes or alcohol, and you don't smoke or drink, the information on that road sign is not particularly interesting, and you ignore it. But there are other road signs that become very critical. On a limited-access highway, for example, the sign that says, "Go Back, Wrong Way, Do Not Enter" is a sign that you ignore only by putting your life in peril.

One of the reasons we work with events rather than trends is that we want to go through a prioritization procedure that allows us to identify the really important events that will make a difference. There is so much information. There is too much to take into account. So, the Future Mapping® process allows us to begin to ask what is truly important. In this program, even though we are not dealing with events, we are going to ask you to come up with what you believe is important, what, in your opinion, will make a difference. We are going to give you an opportunity to report back to us.

We will look at threats and opportunities entailed by these endstates. This methodology is an important tool to get you to figure out what you have to do next, what you have to do a year from now, what you have to do two years from now. You can ask some questions about what ARL needs to do as an organization if it is going to be influential. How should it go about influencing the future to make things better for its member libraries?

We in the networking community are enamored with going faster, however, the question is, where is it that we are going so quickly? We have all heard various opinions about that. The library community is very special and important because the only justification for going more quickly is that people want access to information resources of various kinds. Certainly in higher education and especially in research universities, libraries are key to providing access to information resources.

Each endstate addresses three areas. One is a quick summary concerning organizational and sector actors. The second focuses on the nature of technology, because I believe that technology and actors are important drivers. They provide a critical context for your decision-making. Third are some speculations upon what education and libraries might look like, given certain institutional arrangements and technology as a background.

I do not have a crystal ball, and my claim is not that these are true, but rather that they represent various logical alternatives. Each implies a range of threats and opportunities to the research library community, and our goal will be to figure out what those are.

ENDSTATE A:[*]

The first endstate proposes a world of standards, where everything is interoperable, where we have a plug-and-play computing environment. Especially given the increases in prices we have seen from the commercial sector, it may well be that leading universities and university presidents decide to go into the information services business themselves. This idea has a lot of potential. As Oscar Wilde said, "The only thing worse than not getting what you want is getting what you want." If this is what you want, this presents some very important problems. How would you manage this? Who would manage this kind of business? Do the library communities and universities really know how to manage online services, make them work, make them low-cost, and make them efficient? There are some people who believe that this is possible.

ENDSTATE B:

The second endstate says that higher education, publishers, and service providers in this country are unable to cooperate to expand and extend online services. The Japanese, therefore, provide a high-tech solution, and Elsevier and the other European and Japanese publishers become very important. These developments then have a very significant financial impact on higher education and research generally, since only the most advantaged universities will be able to afford these services. The disparity between have and have-not institutions increases.

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[*] See end of section for complete text of the endstates.

ENDSTATE C:

The third endstate entails a highly distributed computing environment. Distributed computing is an emerging paradigm based on dividing computing tasks across systems and networks. For example, Robert Kahn at the Corporation for National Research Initiatives has thought extensively about a distributed digital library, in which the various functions that are now performed by libraries are not just automated, but are done in a truly distributed fashion.

One of the critical issues in this endstate is how does a patron know where everything is? How do you find your way? You need to know how to navigate the network so that you can find out where the resources of interest are and how to get to them. Recently, I spent some time researching an article for *Publishers Weekly*. I searched the Internet, and logged onto various online catalog systems. As you well know, end user interfaces in many cases differ from each other, as does search syntax, and the user has to know a lot beforehand. These problems have to be resolved. However, this is clearly a time of tight budgets and limited financial resources. Consequently, no one knows how these pressing problems will be fixed.

ENDSTATE D:

Another possible future is one that looks very much like today. It is not exactly high-tech, but it is not low-tech, either. CD-ROM is highly used in this endstate. Online usage has grown at a steady but slow rate. This endstate occurs because people make yearly incremental investments to extend what they had invested earlier. Many people believe that this is a probable future. The commercial publishers might like this because it allows them to protect much of their intellectual property rights. They believe, perhaps wrongly, that their information is more secure in the CD-ROM environment than if it were online.

ENDSTATE E:

One of the technology drivers is that people who have proprietary solutions, such as IBM, Digital, and in some cases Apple, are people who end up providing end-to-end, cradle-to-grave, we-do-it-all-for-you, kinds of technology solutions. In the fifth endstate, they and the commercial publishers get together and provide electronic publishing online in a way that really creates value. It is easy to use, but expensive.

How would you deal with such an environment? Where would the money come from to support usage in this endstate? What happens to the less advantaged institutions and the less advantaged faculty, students, and those who do not have the grants to be able to support this kind of endeavor?

There are many different possible outcomes of the future. I hope that I have been able to raise some questions and set a framework for the team tasks that will allow us to explore in more detail these various alternatives of the future.

After the team tasks, indicate on the ballot which of these endstates you feel is most likely, and then rank-order them. Put "1" for the endstate that you feel most likely and "5" for the one least likely. We would also like your personal opinion about which, for the library community as a whole, for higher education, or for the research community, or all the above, you feel is the most desirable future. If you would, please rank order the endstates along that continuum. We will give you the results to let you know what, as a community, you believe is true.

Year 2000 - Endstate A
University Consortium Creates "Info On-line"

Actors: With leadership provided by a coalition comprised of ARL, Coalition for Networked Information (CNI), and Advanced Networks and Services (ANS), forty leading research universities provide substantial endowment and retirement fund money to compete with BRS, Dialog, Compuserve, Nexis, Westlaw, and Reuters by starting a new information service and by purchasing competing services where sensible and feasible. With government subsidies and grants, this consortium of consortiums creates the largest on-line information repository in the world, including books, periodicals, photos, maps, fine art, and other images. University presses and scholarly societies are enthusiastic. With grudging cooperation from commercial publishers in return for royalty payments, Info-On-line provides inexpensive access to universities and enters the business and home markets. The government cooperates with protectionist networking, technology, and copyright legislation. The Europeans and Japanese remain behind.

Technology: Internationally uniform open standards succeeded in resolving systems management, communications, operating system, database and user interface compatibility problems. Proprietary architectures have faded. Standards make multivendor solutions practical and popular in most enterprises. UNIX is the most popular operating system on machines of all sizes. LANs are pervasive, tieing together PCs, workstations and servers. Mainframes, many using low-scale parallelism, support large central databases and transaction processing. Migration to OSI networking and integration of networks are largely complete in most organizations, simplifying operation and management. Users trade off rapid technology advancement for simplified installation and ease of use.

Impact on Education/Libraries: Spurred by rising serials and book prices, the library community becomes one of the main sponsors and customers of Info-On-line. Related services, such as document delivery by fax and distributed digital printing (DDP) on demand, generate new revenue and help to displace commercial publishers. In 1998, two important commercial publishers leave the scientific, technical, and medical markets. The low cost of on-line information allows library budgets to be reallocated to hiring staff with greater expertise in networking, Unix, and on-line applications, and to librarians with specialized knowledge about particular disciplines to help provide efficient access to the growing on-line collection(s). NSF, NEH, NEA, NLM, and NIH subsidize access to Info-On-line for faculty, researchers, and students at less advantaged institutions.

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Year 2000 - B
Asian Rim Prevails

Actors: American publishers and information companies compete rather than cooperate. The Federal Government is unable to act because there is no policy consensus among the diverse groups that would be affected. Fiber optic cable installed to Japan, plus gigabit networks and broadband ISDN networking, creates high speed paths to Asia. Sony-Fujitsu-Mitsubishi develop effective optical scanners for text images, high speed mass storage devices, and photographic quality color displays and printers. China and Vietnam provide inexpensive labor. North American and European companies cannot compete with long-term financing by Japanese government at very low interest rates. Data servers located in Singapore and Malaysia provide world-wide service despite occasional protests from the international community intended to placate domestic critics.

Technology: Price/performance ratios for microprocessors exceeded 50%/year improvements every year, widening the gap between old and new systems. 250+ MIPS desktop machines come with digital signal processors that enhance speech recognition and image capabilities. Art-book-quality color flat screens, both large and hand-held, are mass produced. Powerful notebook and palm-top computers using wireless communication links are hot sellers and widely used. Intuitive, object-oriented user interfaces allow most people to use common applications and, even more importantly, build their own. Gigabit-per-second networks and compound document software spurred the integration of voice, video and image with computing. Radical new computer architectures (e.g. neural nets) are resources in Super Computing Centers. Networking standards allow lowest common denominator interoperability. Very high speed fiber optic networks required redesign of protocols to operate above 100 Megabytes-per-second, leaving the 1980s standards efforts obsolete.

Impact on Education/Libraries: The wave of library automation projects crested in the early 1990s. Faced with increasing book and serial prices, the relatively high cost of new technology, research libraries were forced to make difficult decisions. Library consortia failed to negotiate substantial discounts for members from the technology companies. Most, therefore, spent large sums for networking and hardware to utilize off-shore resources. Once accessed, however, the use of these resources was less expensive than purchasing subscriptions to serials or purchasing books. Still, the costs for collection development continued to climb through the 1990s, although at a rate slower than had been forecasted at the beginning of the decade. Thus, faculty, students, and researchers got access to materials located in off-shore data repositories at moderate prices. Libraries at smaller or less wealthy institutions suffered most. Unable to afford the new technology required to use off-shore resources, they fell further and further behind during the 1990s . Forced to prioritize new acquisitions, smaller libraries focused on fewer areas. The *Chronicle* reported that the disparity in initial salaries for students graduating from smaller, poorer schools compared with graduates from ARL member institutions increased 50% in the decade.

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Year 2000 - Endstate C
Government Funded On-line Digital Library

Actors: When the private sector and research universities are unable to cooperate, the Federal Government takes new, bold initiatives in copyright enforcement, subsidizing public high-speed data networks, limiting connections to "worldnet," and developing standards for transmitting and storing a wide variety of images. Fearing European or Asian dominance, the "National Information Resource, Employment, and Technology Act of 1999" proposed by President Kennedy creates a fund of 5 billion dollars to put the Library of Congress' holdings on-line. A technology consortium consisting of IBM, DEC, Wang-Data General, and Lotus is the prime contractor for the project (which becomes known as "the East-coast Bailout Bill"). Book and journal publishers cooperate to protect their copyrights and revenue. The education sector gets access at highly reduced rates.

Technology: As network and bus speeds converged, distributed computing matured beyond the client server model. The new paradigm is the network computing model in which data are transparently stored in a location chosen by the system according to security and performance considerations. Standards support a high level of interoperability and automated system management, which allows the network to operate as a flexible multiprocessor, constantly reconfiguring itself to meet demand for processor cycles. On-line directories, which track objects, people, databases and specialized tools, guide users and software agents through a global information utility. Encryption is widely used as government guidelines are heeded. Local storage needs are modest. All machine types are optimized for network attachment and are generically classed as servers. Distributed applications generate large volumes of data and image traffic, which are easily handled by fiber optic networks. Interconnection of national networks extends the global telephone utility to data.

Impact on Education/Libraries: Inexpensive access to on-line materials is a mixed blessing for many universities as scarce funds are shifted from library budgets to fund higher-speed campus networks, higher speed connections to the regional and mid-level networks, and for more powerful desktop computers for faculty, researchers, and some students. Fostered by easy access to on-line books and images, arts and humanities computing becomes pervasive. Budgets for staff, physical plant, and collection development are reduced as the amount of on-line materials grows. Using techniques developed for the on-line digital library, much scholarly communications are only electronic, especially in the sciences and medicine. Peer-reviewed electronic journals of the highest quality emerged near the middle of the decade. Publishing in these new journals became required for promotion and tenure in many academic departments. Other papers and communications of scientific importance are not published at all, but are instead circulated privately by electronic means. Librarians have a difficult time collecting and cataloging such material.

Year 2000 - Endstate D
An Affordable Future

Actors: Worldnet fails because of international rivalries. OSI is found to be too expensive; networks do not achieve interoperability. A world copyright treaty fails to win significant support. Asia, North America, and Europe each support different standards for information storage, display, and transmission. The domestic market for information is increasingly segmented among the business, government, home, and educational sectors, with no one or set of service providers getting enough total market share to justify putting older material on-line. Some periodicals are available on-line to those in the private sector, government and leading research universities who are willing to pay. Fearing widespread domestic and international piracy, book publishers remain committed to paper.

Technology: The economic logic of moving most data center applications to relatively inexpensive distributed systems proved inescapable. Many businesses have converted mainframe applications to high-powered PCs and microprocessor-based servers on LANs. They are incrementally expanded to meet new requirements. But the diversity of platforms makes system management an onerous task. Inexpensive parallel processors provide number crunching and transaction processing services. At least three generations of equipment are maintained by cost conscious users, who hand older systems down to junior employees. Decentralized purchasing led to a morass of incompatible, mostly proprietary systems with limited interoperability. Productivity improvement must justify new purchases.

Impact on Education/Libraries: The '90s look a great deal like the '80s. Library automation continues apace. Funded by the National Library of Medicine and other agencies, Stanford, Johns Hopkins, and Georgetown experiment with putting medical information and publications on-line. Some schools invest large amounts in on-line publishing with mixed results. Libraries invest in CD-ROM technology, which by the end of the decade supports video and high-quality sound in addition to text and images. The support and training costs, however, remain high. OCLC has not yet provided inexpensive on-line access to its databases; hence only librarians make use of it. The lack of a widely available on-line union catalog makes the search for information tedious and time consuming as scholars and students rummage through numerous on-line library catalogs. Commercial on-line providers continue to charge slightly discounted rates for access from educational institutions, making those resources available only to the economically advantaged institutions and individuals. Collection development proceeds slowly.

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Year 2000 - Endstate E
Commercial Publishers Dominate

Actors: At the publishers behest, the U.S. Government vigorously enforces copyright rules, limits bandwidth on connections to "Worldnet," and waves anti-trust rules for a consortium of publishers to put images of their books on-line. Following an intensive bidding war by three technology consortiums (IBM-Philips-TRW- Boeing, AT&T-SUN-Sony and DEC-HP-Siemens), AT&T-Sun-Sony are selected as the prime contractors. North Americans have virtually universal access to newly published books and periodicals at low cost; older published material is brought on-line slowly. Authentication services provide a means for publishers to recover royalties on books printed on local printers. Demand for locally printed books exceeds forecasts. Distributed digital printing (DDP) provides the basis for a publisher-managed print-on-demand service.

Technology: Large differences persist among the proprietary architectures of the top vendors. Proprietary solutions offer advanced technology, better integration and broader functionality sooner than standards-based architectures. This is especially true at the application level. Growth has been concentrated in desktop systems, but spending on high-end machines remains strong. Most suppliers have a basic level of compatibility with the major vendors' architectures; IBM's DB2 and SAA compatibility are mandatory. Most standardization efforts are now regarded as a waste of time and have been abandoned by all but the zealots. The limited number of surviving proprietary architectures makes interconnection practical without standards. OSI compatibility is offered to meet government requirements; application level interoperability remains proprietary.

Impact on Education/Libraries: Despite educational discounts, only the leading research universities are able to afford these services, and then only by demanding a share of the royalties generated by faculty publications. To maintain control and protect their intellectual property, commercial publishers refuse to license databases to be run on local servers. Lacking strong publishers support, CD-ROM fails as a distribution mechanism for most information. Second and third tier schools continue to rely on traditional paper copies; scholarly productivity from those schools declines. Most university presses and scholarly societies refuse to cooperate. Consequently, libraries have to support both on-line access provided by the commercial publishers and more traditional print products in scholarly communications. Budget limitations force difficult collection development decisions. Some focus more on providing on-line access; others focus on print products. The pace of collection development slows. Faculties are generally dissatisfied with the end result, and at the end of the decade, begin to lobby university administrations for greater authority in library decision-making.

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DISCUSSION

ENDSTATE A:

MR. RIGGS: I will report on Endstate A. Our group sees many threats. Greater government intervention is going to be in the form of a monopoly. Somebody said, "Will Jesse Helms have any influence over what goes into the online?" The traditional composition of libraries will be challenged. The archival function will be of serious concern. Endstate A may fail because the user's concerns are not addressed first. Since we had a Canadian librarian in our group, we questioned whether this scenario would be a benefit for all of North America.

As opportunities, we perceived there would be improved access to records and full text. It would help with the information explosion. There would definitely be a differing kind of balance and policy setting among publishers. And naturally, there would be a more effective use of acquisition.

MR. MOSHER: There were some other things we saw in Endstate A. First, many of the building blocks are already in place, though what this would require is further capital and resolve.

Another advantage is that it would involve a kind of merging of librarians and university networks to achieve desirable ends, as librarians are placed as leaders in this enterprise. It would change the ownership of information, take it out of the hands of short-term profit making, where it seems increasingly to be moving now. It would put production, management, and distribution of information together in ways that have great promise.

On the other hand, it might change the whole management structure of information. We do not understand what implications there might be under the threats. The costs themselves could exhaust all the players. Universities would have to alter major priorities, and it might force repositioning that would cause the rethinking of current information organization in ways that currently are unforeseen. It would cause the cost of information to be redistributed in ways that are not entirely clear, as one considers the scenario.

What would the impact be of this scenario on the third world and its participation in the information scene?

ENDSTATE B:

MS. BUTLER: In Endstate B, the Asian rim prevails. We saw several threats in this scenario. I think the primary one is that it undercuts the values on which libraries have been based--that is, the free access to information in a democratic society--and places control in the hands of a few providers, thus making access too expensive to be shared widely.

Also, we were concerned about the exploitation of cheap sources of labor and the assumption in our scenario of a kind of political stability that we would question seriously over time. In fact, our scenario created a great deal of instability in the information industry, but we saw an opportunity based on the unstated assumption that English would still be the international language. We saw an opportunity here for information creators to have more control of the content of the information process, if not the flow. An opportunity for libraries to emphasize many of their strengths in the form of value-added services--such as providing bibliographic control in this networked environment and enhanced reference and information services--and strengthen their role in the identification and description of resources.

Also, we saw opportunity because the technological and networking structures would be in place and could be exploited if we could move toward greater cooperation.

MR. BOISSÉ: We came to quite different conclusions about Endstate B. We thought it could happen. We did agree that control of intellectual resources might be a threat, but we feel that Japanese would become the language of scholarship in this scenario. On the plus side, however, we saw many more opportunities than threats in our discussions. We felt that we could do away with our technical services departments because there would be this big database in the sky.

Under this scenario, the scholar's work station would finally become a reality. There would, indeed, be haves and have-nots, and probably the smaller or the less well-endowed ARL libraries would no longer be part of the organization.

Because all the materials in our libraries would be digitized by the year 2000, we would release enormous amounts of space for our institutions and therefore solve some other problems in our universities.

ENDSTATE C:

MR. GHERMAN: We elaborated on Endstate C and came up with the following: basically everyone in the country would have equal access to all information; the federal government would assume ownership of all information in this country; the Library of Congress would dictate that all authors submit an SGML (Standardized General Mark-up Language) copy of anything they published to LC, so that all future information would be readily available; and LC would take the $5 million and start converting what is in paper now, according to priority, so that we would move forward at the best pace to convert what exists.

LC also would control the directory to all information that we would have in this country, so that it would become, in essence, the union catalog of all information held. Copyright would reside with the federal government. When an author submitted something to LC, she would be paid up front for her contribution. LC would track use and make royalty payments to authors at the end of each year for the use that was made of that information. We no longer would have to deal with copyright permissions. University presidents would continue to serve as they have, reviewing and editing scholarly publications. There could, however, be a type of commercial publication that continued for monographs, especially for those of us who like to take books to bed and read. Other than that, almost everything else would be digitized.

The advantage would be that we would no longer have libraries on our campuses, but just a group of people who would teach people to use the information resources that exist on the networks. The danger we saw in this, as someone else mentioned, is that Jesse Helms would be elected president. Then, since all information was under control of the federal government, we might have trouble accessing certain portions of that collection. But we saw this as a very good world in which we would no longer have to worry about information. Information would be seen as a national resource that we would all have equal access to. There would be no group of people who had any less information than any other group of people.

LC also would make payments on an annual basis to other national libraries for information we would use, say to the British libraries, which also are electronic at this point. There would be a general moving of funds back and forth between national libraries to compensate for information used or distributed internationally. Potentially, this sale of information to other national libraries could be a major source of income to the federal government to help pay for copyright and other things.

MS. BAKER: In typical librarian fashion, in Endstate C we saw most of the threats as opportunities. But I should point out that one of the big threats we saw was the amount of government control.

ENDSTATE D:

MS. MOBLEY: We came up with a number of threats connected with Endstate D, and we also found some interesting opportunities. There are no international standards which pose a major threat for cooperation on a global scale. The resources are very dependent upon political clout. He or she who has the most clout has the greatest amount of resources. There is no concerted attack on telecommunication costs. You prevent the maximum amount of information from getting to the client because there is no way to have staff innovation or easy access.

There is less opportunity for price controls on material. The users suffer because of this, and this, of course, is not a cost-effective state of affairs. An interesting point is that this endstate has no mechanism to address the problems that are caused here. There is no leadership. At the same time, the opportunities we saw were basically in the area of entrepreneurship, that this endstate holds the greatest opportunity for the entrepreneurs. In fact, the U.S. may be in a better posture here because of its research output.

At the same time, this is also an opportunity for universities and scholarly presses to further develop their own publishing and other cooperative ventures, thus leading to a different endstate. We also found that, even though there is no cooperation in this endstate, this may actually force cooperative action because there is so little ability to address the financial constraints in such an endstate.

MR. KOBULNICKY: There are two threats in Endstate D that we wanted to point out. One of them is, what happens after the year 2000? It leaves us with the same problem we are facing right now. The second threat is that the endstate does not mention what is going on around us. We have individuals who are doing research and who are building networks on a national scale, and are demanding services of us that we are unable to perform. This sounds very similar to what is happening right now.

ENDSTATE E:

MR. STEVENS: Endstate E has some inconsistencies: it mentions that everything will be available at low cost, then it says we cannot afford materials. I do not know how to deal with that. User access at low cost gives libraries opportunity to engage in trading. Faculty have a greater role, and perhaps it gives them an opportunity to understand some of the external problems. Local services are not licensed in this scenario.

Collection development slows. Both online and printed materials have to be acquired with limited budgets. That might help control space problems and let us concentrate on services. The two other opportunities are obviously that libraries must still play the vital role of providing older materials. While the scenario talks initially about newly-published material being available, I think the assumption is that it would not be available very long. Presumably libraries might have a role in providing continuing access to this newly-published material once there is no more money to be made from it.

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MS. SWANSON: I would like to now open the discussion. I have asked Bob if he would talk for just a minute about what he heard from your responses that surprised him; what he expected or didn't expect.

MR. WEBER: Someone talked about the distribution and access of information, and I was a little surprised that theme wasn't picked up more generally, since one of the things that happens with electronic publishing is what some people are calling the disintermediation of information. By this, they mean that as scientists and scholars do their work electronically, providing access to that result eliminates the need for publishers. The intermediate steps are at risk because once a scholar has access to the material, he does not need to see it in print.

For example, in the world of physics or in some of the hard sciences, a lot of the work is done among colleagues in "informal colleges." Using the Internet and other resources, most papers are already circulated well in advance of print publication, so that everyone who needs to know, who has a concern with a particular scientific research problem, already knows about it before it ever hits the streets in paper.

As the cost of print publishing goes up, and as the amount of work created electronically increases, this presents a number of threats and opportunities to the library community. How do you know where the material exists that was created originally in electronic form, since much of it may not end up being in print format? How do you catalog electronic versions, and how do you collect them? Whichever endstate actually happens, librarians need to be more deeply involved in the process of knowledge creation. That is one implication of recent changes.

Perhaps new roles for librarians will come about as a result of increasing disintermediation. In many of the online discussions concerning libraries, there is growing concern with how to go about cataloging, citing, and creating bibliographic resources for electronically published materials.

To the extent that scholarly and scientific material is published originally in electronic form, what one needs to know and where one needs to look electronically to perform the traditional functions may change. I am not sure whether that is a threat or an opportunity, but major changes in the way knowledge work is done is one implication of the impact of technology on scholarship, research, and libraries.

The D Endstate is the default endstate, as was already pointed out. It is what happens if you do nothing. Yet it is the one endstate that is most comforting to people because it is familiar; it is what you already know. Another challenge to the ARL community is to avoid still having the same problems in the year 2000. Since D is the "comfortable" endstate, because of its familiarity and its low cost, it means that libraries, as a community, must become more proactive to make better use of technology.

The E Endstate is what happens when computer vendors and commercial publishers cooperate to create new, large systems that add tremendous value and perhaps reduce the impact of libraries as key agencies for providing access to information. I think E is a very plausible endstate, although I am not sure it is one that is highly likely. In contrast, the distributed computing endstate (C) requires a lot more technology than may be apparent. It requires, for example, that the distributed digital library is able to protect intellectual property rights and do billing and cost recovery. It requires advances in technology that are not yet in place. In my opinion, C is much more difficult than it seems.

The high-tech one, the B Endstate, is usually seen as the one that is most difficult. B entails a step function in cost and a step function in performance and capability. But where is the offset in cost? Where does the money come from to fund new, advanced technology? One really has to be an optimist to believe that B will happen. In the future of the computing game we play, B is my sentimental favorite. I would like this world to come into being, but it is also a very difficult transition because you cannot identify enough cost savings or new capital to invest to leverage technology that way.

In order for the Asian rim (Endstate B) to prevail, somebody has to invest a lot of money. You can ask where the capital money comes from. What I am doing now is looking at the technology component of those endstates and asking, "Is that technology plausible?" The open-systems one is very plausible. Library communities and user groups generally are demanding open standards. In some of the others, as was pointed out, there was absolutely no concern with standards.

The A Endstate is where information is built online. Among the things that has to be done there, besides the investment to get the service going, is that you have to make it interoperable, technically, with the wide variety of terminals, of terminal servers, of personal computers, of work stations, mainframes, and mini computers that already exist in our education and research environment.

So, in A, the problem in getting there is not, in fact, finding the money and putting the material online, but making sure that everybody can access it -- you want to avoid a Tower of Babel. In that instance, open standards allow everyone to talk to everyone else. That is what the opportunity is if you can make that world happen. There are people who believe that the world is moving, at least technically, in that direction. There are some very strong forces in the marketplace moving industry and education toward open standards.

One of the things to be concerned about, if you think about technology, is not just what does it do, but what kind of technological environment are you constructing in your universities?

Is it one where you are supporting proprietary standards, the IBM or DEC versions of the world, for example? Are you going to be a force for greater interoperability, for getting everything to interface with everything else? The training costs and support costs, things that you are very interested in, are related to those kinds of issues.

If you have to support three different kinds of hardware platforms to read CD-ROM, if you have to throw MS-DOS out the window, and you have to know UNIX, and you have to know something about Macintosh, and you have to train people on all those, and if the online services all have different end-user interfaces, and each of the reference librarians and support librarians have to know something about those, and then you have to train patrons. These costs are very high.

The A Endstate, the open-standards one where you create a world that works together, is important because one of the offsetting costs is declining training and support costs because of uniformity. Everybody would speak the same language.

One of the things that you can take back home with you and that we will work on later is, what do these threats and opportunities mean in your own institutions? What would you do differently? How would you manage your libraries differently if you thought the world were headed in one or another of these directions? The endstates suggest that the world can look very different. They are tools to get you to think about what the actionable items are that make a difference in managing and steering your ships toward these horizons.

INFORMATION SERVICES AND THE LIBRARY: DEMANDS, RESOURCES, AND VALUES FOR THE FUTURE

Patricia Swanson
University of Chicago

The focus of this discussion is "Information Services in the Library, Demands, Resources, and Values for the Future." It is at this point that we bring down the discussion from the library as a general entity to information services, which is the focus of this morning's meeting.

Let us define information services as those activities, functions, and programs of our libraries where the user is expected, or anticipated, to have contact with library staff or library resources. Library resources include everything from books on the shelf to online catalogs as well as the many databases, which range from compilations of Greek language texts to gene sequences, with all the familiar bibliographic databases in between. Library resources certainly include staff. The contacts people have with a library may be in person, by telephone, by fax, by electronic medium, and (when all else fails) by U.S. mail. The contacts may be inside the library, but increasingly, they are outside the library. The contact may be hands-on, face to face, or it may be through some of the other more inflectionless mediums of electronic systems.

Typically, we now call these services information, reference, referral, circulation, interlibrary loan, and instructional services, and they are found in most of our libraries. In the early 1980s, most of the ARL libraries that participated in the public services study called technical services, "Invisible Public Services." In the intervening years, that too has changed. Now the work of technical services, in providing electronic catalogs with serial check-in and order records available online, has become exceedingly visible. So, the notion of what is an invisible service and what is a visible service is shifting and is probably not as meaningful and useful as it used to be.

I want to set the stage for your discussions by characterizing the environments in which these services are offered today. This characterization comes from talking to our staffs, who are on the line doing these services: new and more services are offered, but relatively few older or traditional services have been dropped. Reference departments range from busy to chaotic, from traditional to innovative, from standardized to pluralistic. Some of our reference departments look like electronic arcades with not only DOS- and UNIX-based machines, but with many different products requiring different software, different search strategies, and customized equipment. We have much more power to help users, but also more complexity. Some of our staff are energized by this environment; some are enervated by it. Some of our patrons are enraptured by it; some of our patrons are enraged by it. While some staff still resist technology, more and more of them are disgusted with us as managers for not providing them with enough. Patrons may be disgusted, too, and you never know quite which to expect there, sometimes because we have gone too far; sometimes because we have not gone far enough.

This, then, is the present state of information services. With this picture, your own views, and Bob Weber's presentations, let us now turn to consider what services will look like in the libraries in the next decade, in view of each endstate.

-Context of the Discussion-

Consider the following aspects in the context of the endstates, or identify others:

- **The nature of interactions with users**
- **Staffing: patterns, levels, competencies**
- **Physical facilities**
- **Key relationships with other campus/institution-wide units**
- **Key relationships with external organizations/bodies**
- **Degree of change from present situation**

ENDSTATE A

MS. MARTIN: We discussed the nature of interactions with users. There will be more of a need to define user needs, a need to balance those people who are going to rush into the technology very enthusiastically and those people who want to cling to the traditional. I do not think any of this is going to be terribly surprising; to continue to provide access to traditional materials and to provide mechanisms for training for access, which is probably the most important difference between the current situation and the future.

In terms of staffing, of course, that would mean a requirement for the highly-trained information and reference people, greater communication and marketing skills, and more technicians. We did not talk about what kind of impact that would have in terms of staffing, but I am assuming that there would be a concomitant reductionof some staff positions.

Physical facilities would require less expansion. The library would be the focus as a major communications node on campus. Somebody suggested it would mean more emphasis on storage facilities for lesser-used materials and, of course, emphasis on access as opposed to acquisitions, as the profession has been discussing for a number of years.

It was suggested that libraries would work more and more closely with computer centers on campuses and become major players in campus communications. Probably the key issue is the relationships that libraries have with external organizations and bodies. A monopoly may be determining all of our relationships, and that might cause some strain. There does not seem to be a real governance structure in Endstate A, despite the fact that a coalition is described.

ENDSTATE B

MR. NEAL: In our discussion of Endstate B, we came up with a number of important items that will have an impact on our service programs. We see a schizophrenic relationship with the academic disciplines in an environment where, perhaps, the sciences are supported in very different ways from the humanities.

Second, given the very significant investment in new technology built into Endstate B, we are very concerned about the creation of information haves and information have-nots, and how motivation to share and cooperate on a national and international level might be affected by the situation.

Third, we raised a number of questions about our preservation role. We are not obviously concerned as much with the preservation of the medium in Endstate B as we are with the preservation of the information. We talked about academic reward systems in our colleges and universities, and how shifts in the measurement of faculty and student productivity might influence our service programs. We talked about the ability of the library to have a greater impact on the curriculum, particularly through the development of programs like distance-learning and electronic classrooms.

MS. HOGAN: We broke down over the initial assumption built into this: that high-tech hardware was the only consideration. The scenario did not include high-tech software; that is, is there a knowledge navigator built into this, which dramatically paints one picture of the library and librarians, or is that not here? In fact, one is overwhelmed by this wealth of information and the role and the needs of the library as a mediator are even morose. We broke down over that and therefore did not continue on the other points.

MS. SWANSON: It is an interesting point because there are very different implications for staffing and the kinds of staff that you have, whether that software is provided there or whether the librarians are software creators someplace.

ENDSTATE C

MS. SHAPIRO: Much of our discussion on Endstate C paralleled the discussion of Endstate A. But in addition to those comments, we also felt that traditional library services would continue in some form, that these services would be more personalized, and that the training and teaching function of librarians would be highlighted in this kind of environment and would become extremely important.

In terms of staffing patterns, there would be a need for more specialized subject knowledge, and we thought that there might be a shift toward public services from technical services. Perhaps there would be some shared staffing, where people perform both functions, much like the smaller libraries do now. We also thought that librarians would be involved in more research with faculty.

In terms of physical facilities, there would be less demand for traditional space, but there would be increasing demands for space that we are not used to providing in libraries. There would be continuing demands for study space and meeting space in libraries. That is a function that the library serves today, as a cultural center or social center on our campuses, and which might be highlighted in this kind of environment, particularly if the students spend a good part of their educational experience in front of a PC. They may want to have an opportunity to meet face to face with people, in a pseudo-intellectual environment, as opposed to in a bar.

In terms of relationships with other campus units, we felt the same with respect to libraries and computer centers, but also that there would be deeper involvement with the curriculum and development, librarians being involved in developing information literacy throughout the curriculum. In relationships with external bodies, librarians would be involved more on a national level in terms of networking policies addressing the kinds of information that are made available. Also, there would be closer relationships with funding agencies. In terms of the degree of change from the present situation, given the way the scenario was written we thought it would be significant, but we do not believe the scenario.

ENDSTATE D

MS. SCOTT: Endstate D is the steady-state one, of course. We thought that the present problems would become much more acute. Because of the variety and complexity of the hardware and software that would be used, there is going to be a need for greater and greater emphasis on training, both of staff and of users. In fact, we saw that, because of the variety of technical options, there would be more use of technology from home, office, and dorm, and this might mean that libraries would become more like warehouses rather than places of socialization.

We would have to develop more extensive document delivery systems. We would also probably develop a distributive model for service where we would have a roving public service librarian to go out to faculty and other groups to try to help them deal with their information problems. Relationships with computing centers, of course, would become key.

We also saw more formal consortia-type relationships because there would be an increased need to share resources. Finally, we saw that ARL would become more important, particularly in the area of training. Because of the variety of technology, we saw a sub-office, the Office of Technology Readiness.

ENDSTATE E

MR. GHERMAN: Endstate E is a depressing scenario, in which the publishers control everything, and the libraries have very little money left to buy anything. In that environment, what we saw was the decentralization of information on campuses where faculty with grants and money will buy information directly from publishers, bypassing the library. Faculty without funding, such as those in the social sciences, will be beating on our door for more of what we cannot give them.

We will have fewer staff, especially in technical services, because of the lower level of acquisitions. Those staff will have been turned into dollars to provide the few information resources we are able to buy. We will have a lot of study space in libraries because our collections will not be growing as rapidly, and we will not have as great a demand for space.

We will have a more limited role on campus than we have now because we will serve less and less of an important function, and we will really become an archive for the paper collections we now have. We probably will have shortened hours because people will not need that much.

MS. SWANSON: It is interesting to think about these responses in terms of themes. The only endstate that causes the need for less staff is the depressing endstate where the terms are not events we want to occur, but rather are by-products of unhappy circumstances. All of the rest of the endstates demonstrate the requirement for staff that is more sophisticated, both in subject and in technology. Is it possible that is one of the dilemmas facing libraries in the future? The other theme that runs through the responses is the increased need for training and education of both our staff and our patrons.

A PARTICIPANT: I want to mention that with Endstate A, we saw that there would be tension between the library and university administration. But we also think that, indeed, with the free access to information, the fact that we wouldn't be buying library materials might indeed force a reduction in staff.

MS. SWANSON: But a forced reduction is quite different from a reallocation that we control to achieve a more desired end. Also, I noticed that the discussion focused on the integration of services and of libraries, in general. The responses of all the tables and all the groups was not reference desk-oriented, or circulation desk-oriented, but had a library-wide orientation. That is probably the result of the technology in libraries that blurs traditional departmental distinctions and necessarily puts the focus on the library as a whole.

MS. SWANSON: The results of the balloting are as follows:

MOST PROBABLE: D

MOST DESIRABLE: A

	Probability	Desirability
A:	3 (280.5)	1 (121.5)
B:	4 (302.0)	4 (314.0)
C:	5 (320.0)	2 (225.0)
D:	1 (131.5)	3 (263.5)
E:	2 (241.0)	5 (351.0)

(The lower the total score, the more highly ranked was a given endstate)

MR. WEBER: These results have some surprises for me. A lot of you felt that Endstate D was most likely to happen and that Endstate A, creating the online consortium, was really what was most desirable. I predicted those results, however, what I find amazing is that there is consensus here that the one you hate is the second most likely possibility. That is very interesting. It may be that it is a projection of your worst fears, but I think a lot of things have to happen for that scenario to come to pass.

In terms of what is desirable, I am a little surprised that the distributed library is second. That vision requires, in some ways, as I said earlier, that a lot of things get done technically that are very difficult to do today.

To answer an earlier question, Endstate B assumes the existence of automated helpers, for example, knowledge robots, "knowbots," and errant agents. Robert Kahn has developed programs that will go out in the network and find resources and bring back answers. I certainly would agree that some capability like that, in terms of software, would be properly part of this endstate.

What you do not want to happen, and rightly so, is to have the commercial publishers run things. Apparently the 'Asian Rim Prevails' endstate entails another loss of control and the autonomy of the library community, in addition to being costly. That is why that is fourth in terms of desirability.

These results are very reasonable, reflecting real constraints and the current situation. One of the challenges is, "How does the library community navigate toward what it wants in terms of Endstate A or Endstate C?" One of the things to think about in the future is exactly how to do that, what role your institutions play in that process and what role ARL, as an umbrella organization, should play in helping to achieve those ends.

MS. TAYLOR: I felt that none of these scenarios was more or less likely to happen as a single-block scenario and that the more likely future is some combination of all five. So, I had some difficulty in necessarily looking at one and saying that this is much more likely than another.

MR. WEBER: It is a common reaction in all the planning that we do with this methodology. In fact, we do not believe that the world will be any one of these. These are prototypical. They are designed to encourage thinking and analysis regarding many difficult issues. We fully recognize that the world will not look like any one of these to the exclusion of others. But they can help you with planning for the future, in doing your long-range planning in your institutions, and to be able to ask your staff, for example, about how they would provide services of different kinds if the world turned out this way.

This is a potential benefit that you may want to explore when you get back home. It seems to me that ARL is challenged to figure out what kinds of things are really critical in achieving a particular outcome. If you do nothing, the likelihood is that you are going to end up with Endstate D, and that is only the third most desirable. The do-nothing endstate, the evolutionary one, is one that you do not want but you think is most likely. So, the challenge is to figure out how to avoid that outcome and be proactive about getting somewhere else.

MR. DeGENNARO: I agree that no one of these is going to come to pass; it is a mixture of them. But what occurs to me is that no one can predict the future. So that the best thing we can do is to try to create a management and organizational structure that is geared to a rate of change unprecedented in our institutions. Unless we do that, we are in really big trouble. The big problem of the next decade is not so much these technology scenarios, but that we have a management and leadership problem that we need to address and solve.

MR. GHERMAN: I was struck that the two most desirable ones that we picked are the ones where we retain the highest amount of control, but in the two most likely events, we lose control over our environment. What that says to me is that as a group of leaders, we do not believe in our own abilities to control our own future and destiny. Increasingly, controlling this environment is not a concern of technology or money, but it is a cultural issue that we have to bring to our entire campuses and administrations, pointing out that this is an issue of control over information in the future for better or for worse, and we are the only ones who can do it. .

MR. PETERSON: Building upon what the last three speakers have said, it seems to me that the challenge is to take the best that we have gleaned of the five possibilities, sit down to see whether, in our imagination and in the spirit of creativity, we could begin to plot that direction of the next decade, taking the strong elements and bringing them together in some sort of a programmatic scenario.

MS. VON WAHLDE: Ken has issued a very interesting challenge. I am also struck by what Dick DeGennaro said, and I agree with him. But as a tension-filled library director, my sense is that if I believe him, and I do agree with him, I need to spend a lot of my time changing things internally and inspiring the staff and working at home. At the same time, the dilemma that I see is that we need to be more active with a whole variety of players, that we need to be influencing technologists, vendors, campuses, and computing people. How many ways can we be pulled apart? Now the question is, how do we find the other players to help us, or what is our role in finding the appropriate organizations to work for us in those directions?

Certainly ARL is one of them, but there are many others, too. We have very frantic schedules, and we run around to a lot of meetings, but are we always being very influential at these meetings? Perhaps, we are taking small steps, but if we were to follow up on what Ken is suggesting, determining what is our preferred future and trying to exercise our energies that way, we would feel, perhaps, more satisfied and accomplish more.

MR. WEBER: I can understand the frustration about not exactly seeing how to get to the future from here. It is a real dilemma. My own opinion is that there are a lot of things that could be done to flesh out the where-do-we-go-from-here question.

MR. LUCKER: I just had a nightmare vision. Instead of us sitting in the room, think of the following people discussing this topic: a group of provosts, a group of computer center directors, a group of for-profit publishers, a group of not-for-profit publishers, a group of telecommunications experts, a group of people from industry, a group of our own faculty, or a group of people in government. Each of these, as a group, looks at these scenarios and thinks about what they would like to see.

We are going to have to bite the bullet and not only try to bring people into our realm of thinking, but we have to get into their realm of thinking. We are not going to get people to think the way we do just by pushing for it and believing that we are the best people. We need to go out into the arenas where these things are being discussed and argue for our position. I am both excited and depressed by how much of our future is in the hands of other people.

MR. E. SMITH: There is something that is bothering me with respect to what almost everybody has said. That has to do with what I would call isolationism. Looking at Endstate C, is that what is going to be imposed upon us? We have to be realistic with respect to what is happening, say, in the Far East. If we want to take a look at the Pacific Rim scenario, that is another sort of thing which we have to compete with. Maybe we are going to be told that we must have national policies which permit the United States, Canada, and other economic unions to be competitive in a global way. That is going to have an impact on us, and it is going to have an impact on organizations such as the one I head, which is not an academic institution. But I can see how academic institutions are going to be able to avoid that. So, it seems to me that you can set roles for yourself, and so on, but those roles are going to somehow have to fit in with the national policy, which is going to fit into the global economy.

MR. WEBER: Yes. One of the things that individually and as an organization you should think about is how to influence national information policy in whatever is the appropriate direction. There is a lot that can be done to steer that policy in directions that, as a group, you feel are favorable.

MR. CAMPBELL: We ought to demand that there be some tremendous reform in the library schools that remain, and we also might make a concerted effort to recruit some leadership into our libraries, particularly looking for people who do not think like we do.

MS. SWANSON: Thank you very much for your participation, your good spirit, and your willingness to suspend your own particular bias and to look at the world in a different way.

PROGRAM SESSION II

INTRODUCTION

MS. SHARROW: Our task is to discuss how research libraries will meet the challenges presented by the various endstates and the role and actions of ARL within this context.

Over the past five years, it has been my good fortune to be able to work on several committees and projects with our next speaker. Clifford Lynch is the Director of the Division of Library Automation in the Office of the President at the University of California. It is hard to pick up a periodical on library automation today and not find an article authored by Clifford. He has been for several years a leading authority on the complex subjects of library automation, networking, and interconnecting systems.

He is one of the developers of UC's MELVYL online union catalog, and he is currently a principal investigator for several grants, including a Digital Equipment Corporation sponsored Z39.50 project to link the MELVYL catalog and the Pennsylvania State University LIAS catalog. Clifford has been at UC since 1979, and he was previously at NYU. He holds bachelor's and master's degrees from Columbia University and a Ph.D from UC-Berkeley. Clifford has just prepared a thoughtful and informative report for the U.S. Office of Technology Assessment (OTA) entitled "Electronic Publishing, Electronic Libraries, and the National Research and Education Network: Policy and Technology Issues." Clifford will speak to us on "Roles and Actions for ARL."

INFORMATION SERVICES: ROLES AND ACTIONS FOR ARL

Clifford Lynch
University of California

Here at the beginning of the '90s, I see a great deal of looking to the future and planning within the library community and, indeed, many broad communities throughout the United States. Reading the wonderful article from *Library Journal*[1] that described where we were in 1980, I was reminded of a museum exhibit that some of you might have seen a few years ago called "Yesterday's Tomorrows" that had models of atomic-powered cars of the 1950s and some similar inventions such as the personal helicopter in which you would soon be commuting to work.

Sometimes we do not predict technology as accurately as we might like. There is an essay by Arthur Clarke called "Profiles of the Future," in which he discusses failure of vision and failure of nerve as the two endemic errors in predictions, and in which he characterizes various predictions and why they have broken down on those two counts.[2] We have been surprised often over the last ten years, and I hope we are going to improve our vision in the next decade.

We are much more sensitive to the technology monster today than we were in 1980. It is interesting to remember, without arguing the history of technology, that personal computers, local area networks, and the Internet did not figure in most of our planning for 1980. They existed as embryonic technology, but they were not considered planning factors. If you survey the information services environment today, it is certainly characterized by a lot of computing power in many individual hands and is characterized by the creation of an electronic community through the Internet.

Consequently, many of our current issues are based on resource sharing, the connection to other institutions, and what that means to us. At the same time, we are also trying to survive in a period of tremendous budget stress for reasons that all of you know far better than I, having to do with rising costs, rising expectations, and the multiplicity of services and materials that we are expected to handle.

I would view the rankings on the endstates this morning a little differently. People said the most probable direction is to continue the way we are going. The most desirable scenario describes a world in which online information is largely controlled by the academic and the research communities. I don't see that these two views are incompatible.

While we may have visions of where we want to go, like Endstate D, we all believe very strongly that we are going to get there in an evolutionary way from where we are now. The process will be slow and difficult. The way we rank the desirability of the endstates describes our evolutionary goals. Because that change is going to be quite slow, and we cannot stress enough the fact that we are going to be living in a transitional environment the next ten to fifteen years. All information will not suddenly go online, nor will all the paper disappear overnight.

Many of you have lived through the confusion and complexities of the initial transition from a card catalog to an online catalog and the problem where the online catalog didn't have everything that was there, and the card catalog did not have everything that was on the online catalog. Probably neither of them cataloged everything in your collection, and that introduced confusion and complexity. That experience was just a tiny little slice of the overall, long-term transitional environment. The lessons we learned in the early stages are going to be written much larger. Within this environmental picture, I was asked to focus on some issues that ARL can address usefully to expedite and enhance this process, and to help us all cope more effectively in this new transitional environment.

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[1] Savage, Noël, "News Report 1979," *Library Journal*, January 15, 1980. pp. 167-181.

[2] Clarke, Arthur Charles, *Profiles of the future; an inquiry into the limits of the possible*. New York, Harper & Row, c 1962.

ARL is a wonderful focus for community issues among research libraries. There are many institutional issues that need to be considered, based on the priorities and plans of individual institutions, and I think ARL can play a tremendously effective role in addressing them. I just want to throw out about seven or eight such issues in the next few minutes, without elaboration, and perhaps seed some discussion.

I think ground rules must be defined for this new networked community environment. Resource sharing and how to manage it and how to balance service to one's institution with service to the community at large are not new problems. In fact, we have had to cope with them in inter-library loan functions. Broader access to online catalogs by the overall user community is increasing the pressure on inter-library loans at many institutions. Increased use is taxing on online catalogs and similar retrieval systems. How do we define ground rules to govern 400 outside institutions who are searching my online catalog, and using a lot of resources? How do I deal equitably with the institution that won't "play in this circle of gifts," as I have heard it described?

Technical support is very important. Public service and reference people are terribly stressed in libraries everywhere by the endless demand for their services and their help. How do you assign priorities in a library where you have just opened up fifty new information resources, all of which have different user interfaces, none of which you have mastered, and patrons show up, as usual, demanding help with these fifty resources? We need effective support structures for remote systems.

We need to decide what kind of commitments institutions will make as players in this community. We have network resources everywhere, and are faced with the whole question of policies for describing them. Do we catalog them? Who catalogs them: the institution who hosts the resource? Every institution that provides access to it? Some of the limited experiments made to date in network-distributed text raise endless problems.

Think about Project Hermes, where you have Supreme Court opinions isolated from all the other legal literature online. How does the library make them available? Does it catalog them and say, "Get them from there?" Does it move them to the local system and make them available? Does it ignore the whole thing? I do not know what the right answers are, but certainly there are a lot of problems to resolve about how to operate in that world as a community.

We should, as a community, consider creating our own databases in the abstracting and indexing literature. I anticipate a crisis in the mid-'90s with commercial vendors of abstracting and indexing databases. These commercial databases are a great success, and they are heavily used; but their costs may escalate, and I would not want to explain to the faculty why the library cannot remount it when the contract comes up for renewal. We may need to work as a community to create some resources like this ourselves.

We have several issues with vendors. We have a potential crisis in the market of turnkey automation systems. It is a relatively small, fragmented market with many vendors. There are a few high-end institutions who have significant needs now, but when you project into these endstates what we would like to achieve, such as those events involving massive, distributed online databases, I do not anticipate that many of the existing vendors will have the R&D capital to support us. I am not sure that such an environment will be big enough to support a lot of competing vendors, and these are going to be very expensive systems. At the same time, I am not sure that the vendors of existing systems are closely attuned to, or even interested in, our needs.

When you look back over the last couple of years at what is on the Internet and what is not, it is remarkable how comparatively well institutionally-developed systems seem to support that network access in general, and how difficult it has been over the last year or two to get vendor systems on the Internet. There are *still* some vendor systems that are a real problem to put on the Internet. ARL as a community, perhaps, can start getting this message to the vendors.

The idea of fee-for-service is an ugly concept in the library community. But we will have some new services on the Internet that may be transactionally charged, so we need to think about how we will deal with them. I do not know what the answers are, but it is an issue that will be raised.

The phenomenon of all the new electronic flora and fauna on the network such as mailing lists, electronic journals, and things like that, has not been welcomed, as far as I can figure, by the library community. They are not collecting it; they are not making any effort to make it available to their patrons. I think this is a decision we may regret in ten years when this material is recognized as part of the basic scholarly record, and we realize we have misplaced the first ten years of it. There are other new forms of scholarly communication in some communities, such as the sharing of hyper-card stacks. I do not know how we should handle this, but I do not think we can pretend it will go away.

The emerging discipline of data archives raises interesting questions for many institutions: Who is going to deal with the problem of data archives? Where are they going to live? What is the institutional role going to be? ARL libraries will make a significant contribution, and there have been some very interesting prototype projects in this area. The big science initiatives being developed, such as the human genome project and the global change initiative, come with enormous multi-disciplinary databases behind them.

Let me add one more item that is very ARL-specific. I believe that the libraries are going to have to adopt a new focus as providers of access rather than collectors in this new networked world. This focus needs to be reflected in, for example, the way ARL ranks libraries. My understanding is that right now rankings are oriented to holdings rather than access. This perspective must be completely rethought in an environment of networked information.

I will close by saying that, perhaps some day, we will know that we have arrived at the end of the transitional environment when we welcome the first ARL director whose library is all electronic. Could that happen? Will it happen in any of our lifetimes?

I hope my sketch has highlighted some areas in which ARL can actively propel us further into that transitional environment and help us all adapt to it. Someone described herself as a highly stressed university librarian. This is understandable, given the complexities in this environment. I do not think it is going to get any easier for any of us. But working together, there is a lot of progress to be made.

DISCUSSION

-Context of the Discussion-

How will research libraries meet the challenges presented by the various endstates and the library services that might result? How do we get there -- or avoid getting there -- from here? The goal of the discussion is to identify future directions for ARL.

- **What kinds of changes have to occur in the research library arena?**
- **Can libraries have an influence in shaping the desired or likely outcomes, and if so, how?**
- **What strategies are appropriate for the national (versus local) level?**
- **Will past ARL initiatives to strengthen research libraries' services and influence policy continue to be effective?**
- **What are some specific programs that ARL might develop to help libraries meet new information service needs and goals?**

MR. BILLINGS: We have decided it is not business as usual. The tablets have been dropped. We have got to do something different, and here is a grab bag of things we need to do differently. We need to recognize the way authors are compensated, and not just in the area of scholarly communication. For instance, we should assume a major new principle, that we need to realign the total resources that go into the information flow, all the way from the author to the user; for example, getting scholars' page costs redirected into some other form of refereed distribution of their scholarly efforts.

Libraries should become better activists. We need to influence library schools. We need to use new organizations like CNI, broaden the arenas through which research libraries influence the informational and educational environment. We also feel we need new technical linkages, such as Internet. We need to make better use of networks, such as OCLC and RLIN, that are in place. I believe we should grasp new informational opportunities that libraries can control, like new electronic publications that make scholars have to pay more direct attention to the library as a distributor of information.

MS. MOORE: We, too, started from the point where we should try to influence library schools and then quickly came to the conclusion that we have not had very great impact in the past and that, perhaps, ALA had a better chance of that through the accrediting system.

ARL should concentrate on postgraduate training and technical training for new librarians, as well as for middle and senior managers. The kinds of things that we should be strengthening are the courses on analytical skills and strategic planning, and there should be a whole course for new librarians on higher education and how it works, the importance of research policies, endowments, and so on. All of the information directors eventually become familiar with would have been useful to us twenty years ago.

In addition, it will be very important to continue with the lobbying that is going on and to strengthen that, and to provide the kind of overall policy discussion in the Coalition that is beginning on the research network. This avoids us all having to fight the same battles with our computing centers on a local basis, and the Coalition provides a very useful framework for discussion.

MS. CHAMBERS: Individual libraries are going to have to abandon their propensity for idiosyncratic fixes and be more willing to accept some standard software and hardware. We are going to have to have new algorithms for funding what we do. The current algorithms do not reflect the things we are talking about, such as the rapid obsolescence of equipment or software, or even the rapid obsolescence of information. That is, information has to be updated very, very frequently. Processing of information, our traditional technical services activity, is going to have to be as instantaneous as the availability of information. The current way we do that is not very instantaneous. One question asks, "Can libraries have an influence?" We think libraries are inanimate objects. Can librarians have an influence? They can if we assert our leadership. We can do it; the question is, will we do it?

As far as strategies are concerned, whether they are internal or external strategies, they are the same, that is, building alliances and partnerships. The Coalition for Networked Information is a good example of embracing areas outside of librarianship, like computer center people.

We think that ARL might serve us in the same way that *Consumer Reports* serves the public; that is, do research on behalf of all of us that we then will not have to do individually. Finally, ARL is going to have to take the lead in establishing new criteria for measuring our effectiveness. One suggestion was that we might, on an annual basis, tabulate innovations in ARL libraries and report those.

MS. NUTTER: Our group focused on whether libraries or librarians can have an influence on shaping the desirable and most likely outcome, and if so, how. Some of our conclusions, you have already heard from others. We kept dwelling on the word "influence." There is a real need to reach those folks who are at the control point, allocating responsibility and resources. There is also a need to educate the campus power structure at the national level, not just within our own local institutions.

ARL might develop a vision statement of the role of libraries and provide that to COPA, the Council on Professional Accreditation, and try to shape that effort. A lot of the efforts that we talked about have to do with marketing. We thought that this was an obvious role for OMS. I think one of the things that came through loud and clear was that OMS has a strong future in the organization. We feel that ARL needs to press on full speed ahead with the initiatives of the last few years: lobbying, working with the media, developing partnerships and liaisons. OMS is a good example of that.

MS. BAKER: Our table focused on publishing. We began talking about intellectual property issues, not just in the electronic world but also in the print world. We dealt with the fact that the rewards for creating intellectual property currently do not come to the creator or to the library or to the university. We might want to advance some education to break that cycle. We also talked about publishing and our relationship to scholarly organizations, and that we need to be talking with the chemists about the kind of issues that are raised. We would encourage ARL to help us to facilitate those decisions.

A PARTICIPANT: We are really talking about a position statement on what a research library should be, and a library school, as well.

MR. NEAL: We want to endorse in very strong terms the need for ARL to once again take a strong position on education for research librarianship. We picked up on Dr. Lynch's theme about the important role we need to play in archiving and providing access to new forms of electronic information. We are not quite sure how to cope with that, but we think ARL can provide some strong leadership in that area. We saw research libraries as maintaining strong bridges between the technology communities and the scholarly and learned society communities. It is a role that we alone, perhaps, can play effectively on our campuses and nationally.

ARL could provide some strong direction in governance models for multi-institutional systems. Many of us are faced with working together on a state, regional, and national level, and there are new ways that we interact as individuals and as organizations. Governance models in that area would be very helpful.

MS. HOGAN: Our group picked up on the term "research." We speculated on why it is that we all agree that we are buying less, but it does not seem to be having any impact on the explosion of published materials. Is there, in fact, a relationship between our inability to collect it and people's inability to find it, or any suppression of their wanting to publish it? Maybe we need to do some more research on what we are not buying. Is it going to affect research and will it affect our ability to do science and research development? We do not know.

MR. MOSHER: The one item that has not reached the agenda yet, and that our group talked about quite a bit, is change. Librarians are agents of change and managers of change. We hope that library schools will include elements of how to do those things in their own agendas and that we librarians would be leaders in our own institutions, as well as within our own libraries, in encouraging people to welcome change, understand change, play with it, and be leaders in it.

MR. SHAUGHNESSY: It was in the early 1960s when Ralph Shaw said that we have had far too many self-congratulating articles, and we should, once and for all, put an end to such writing. Yet we find now in the 1980s and 1990s that a number of other authors are making a fortune writing about how various companies do things well. Tom Peters is but one example. So, we are not supposed to write these articles, but the MBA industry is writing these articles and is making a fortune as a result.

Thinking about ARL meetings in that scenario, it seems to me that we could learn a great deal from ARL meetings that focus on how our members have been able to deliver quality services at reduced cost and meetings that address small but important innovations in our libraries. In other words, we should not be bashful about bragging or talking about how our libraries have done something well. We can all learn from such programs.

The second suggestion concerns SPEC kits, which we all find immensely useful and wonderful. But make the spec kits a little more specific on matters concerning the new technology. For example, a SPEC kit on how to get onto the Internet and access various OPACs. More importantly, once we have accessed those OPACs, how to get off the OPAC without pulling the plug. This kind of basic nuts-and-bolts information would be very useful.

The third area is on minority recruitment. All of our campuses are so concerned about diversity and how we might deal with diversity, yet we are hit with statistics from ALA that indicate that fewer minorities are coming into the profession than ever before, and this is a scandal. What can we do about it collectively and individually? This is being addressed now, but it is something that is very much overdue.

A PARTICIPANT: One article that came out of our discussion is the committee structure of ARL. Several of us felt we really ought to put on the agenda an examination of the present charges to the committee or the kind of committees we have. We wonder if we organized our committees in a way to deal with some of these issues for the future. Someone mentioned, for example, the preservation committee, thinking about the preservation of electronic data. There are other kinds of questions. People felt it was time to look at the committee structure.

MR. INGLES: One of the things we talked about briefly, and it came out of this morning's discussion as well as Mr. Lynch's discussion, is in the rankings of the endstates this morning. We had a high regard for those activities that led to collective action. Yet, we heard before that we are driven mostly by institutional imperative. Perhaps one of the changes we may consider is servicing the collective imperative, or giving more thought to the collective imperative, rather than focusing on the institutional imperative. Let's shift that paradigm to the future and look at the way we can better cooperate. Let cooperation drive us. Let's not be driven as much by the institutional imperatives.

MS. STOFFLE: We have to stop looking at some of the incidental problems, and look at the systemic problems. We have to identify what are the major problems of the academic research library and focus on why we are not controlling the environment. We need to look at where the land mines are. We need to look at changing the incentive system.

What are the incentives for changing? To change, we need to look at how we rank our libraries. We need to stop looking at the print collection size and the size of our staff. We compare numbers of books, serials, and staff to determine a great library. What if great libraries were ranked by how we use our staff, instead of the numbers that we have, and how efficient and effective we are in providing service/access?

Another area we failed on is copyright. What if, instead of the constant discussions about copyright and fair use, we did away with copyright? How would that change the whole information system? Would that open up things? There is an interesting article in one of the latest issues of EDUCOM that talks about the original purpose of copyright.[3] Maybe we need to look at that and look at the issue of value added. Do we want to encourage the individual author, or do we want to encourage collaboration? Copyright does not encourage collaboration. Copyright originally facilitated access to information. Does the current law, given new technologies, now mitigate against information dissemination and new scholarship?

Finally, for ARL, the Coalition for Networked Information is a good example of what we can do working with others. But don't we need to form other coalitions? Don't we need to be more active with the scholarly community, with administrators, and even with students? What about the national student lobby? Students spend a lot of money lobbying, both at state government and national government levels. What have we done to involve them? Do we have materials packets for these kinds of groups? Are we out doing studies and providing them with the information that might make them our allies?

MS. SHARROW: The ARL staff and the board will take your ideas and prepare a paper on which we will continue to work with you during the next year.

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[3] Garcia, D. Linda, "Information Exchange: The Impact of Scholarly Communication," EDUCOM Review, v.25, no.3 (Fall 1990) pp. 28-32.

TOWN MEETING DISCUSSIONS

INFORMATION NEEDS IN SCIENCE AND TECHNOLOGY

Introduction

MR. LUCKER: We are going to discuss some of the major issues that are facing all of us in the area of scientific and technical information. For once we are not going to talk about serial pricing, which is probably a relief. Certainly, in the environment in which we are operating, the mission of providing access to scientific and technical information to our users is increasingly important and much more complicated than ever before.

Some of the factors that affect our ability to collect, organize, and disseminate scientific and technical information involve such things as big science and research projects. The problems of both collecting and providing information to people working on large science projects are distributed all over the globe.

A second factor is the impact of electronic data storage on scientific and technical research and the fact that, increasingly, basic scientific and technical information is no longer stored in paper and no longer available easily in statistical and numerical data.

Third, there are new methods of communication among scientists, informal and formal telecommunications networks, unofficial and official communications traveling back and forth with little documentation. In many cases, nobody is aware of their existence.

Fourth, somewhat juxtaposed is the issue of international scientific cooperation, the transfer of scientific and technical information among countries, and the ability to have open exchanges of information, at the same time, we are in a highly competitive situation worldwide in science and technology, and we need to find ways to improve our ability, in the United States and in Canada, to compete effectively.

Finally, as if we didn't have enough problems, there is continuing growth in scientific and technical information. We are dealing with an ever-growing data stream.

The program focuses on a number of areas dealing with the role of the government in scientific and technical information, and how the government, academic institutions, and research laboratories can work together to improve the flow of information.

Our first speaker, James L. Green, received his Ph.D. in physics from the University of Iowa in Iowa City in 1979. Since 1985 he has been the head of National Space Science Data Center and the associate chief to the Space Data and Computing Division at the Goddard Space Flight Center in Greenbelt, Maryland. The National Space Science Data Center is NASA's long-term data archives and manages more than six gigabytes of digital data and over 90 million feet of film. In addition to his managerial responsibilities, Dr. Green has published over thirty scientific articles and refereed journals. His major activities in space science research involve various aspects of physics of the earth and Jupiter. Before becoming director of the NSSDC, he was a scientist at the Marshall Space Flight Center in Huntsville, Alabama.

Our second speaker is Elmer Smith, the director of the Canada Institute of Scientific and Technical Information (CISTI), and a colleague of ours for many years. Elmer has been the director of CISTI since 1978 and has been responsible for promoting and providing scientific and technical information to the people of Canada for their economic and regional developmental needs. While he has been at CISTI, he has been responsible for the development of CAN/OLE, the online system of international and national databases, and for a number of technical innovations and delivery of worldwide scientific information. He has been with the federal government of Canada since 1973. Previously, he was Chief of Library Services for the Ministry of Transport and then Director of the Library Division of Agriculture Canada. Before that, he had long experience in the area of special libraries, having worked for a chemical company and for a company in the metal manufacturing field. He is going to talk today about Canadian scientific and technical information programs.

Third will be Robert Zich from the Library of Congress. Bob is now a Special Assistant to the Associate Librarian for Special Projects. With the appointment of James Billington as Librarian of Congress, Bob helped plan the Management and Planning Committee and later served on its Steering Committee. At the present time, he is guiding the special project team on a National Library for Science and Technology, which is what he is going to talk about. He has also worked on a variety of library-wide problems and projects, been a member of the Committee on the Future of the Library and the Optical Disk Advisory Committee, and chair of the Reference Round Table.

Finally, Martin Cummings will talk about a project on which the National Science Foundation and the Council on Library Resources are working in the area of engineering and science indicators. Many of you know Marty as the former director of the National Library of Medicine. For a number of years, he has been a consultant to the Counsel of Library Resources.

Dr. James Green
National Space Science Data Center

I would like to talk about how scientists are getting access to data and information about data. Metadata means information about the data. Metadata are things like instrument characteristics, what measurements are made, where the spacecraft is when astronauts look down at the ground, longitude and latitude. All those things that the user needs to understand and synthesize before he actually orders the data.

We are very interested at the National Space and Science Data Center, which is NASA's archive, in being able to abstract information from this data and getting it to the users, so they can make decisions on what they want and order exactly what they need. We are looking at a variety of ways to provide that information to them in the way that they can best handle it.

Before telling you what we are doing now, I am going to give you a little background and history on how scientists have interacted in the past with data and information about data. Between 1960 and about 1980, NASA usually sent out requests-for-proposals for instruments on specific satellites. Universities or other government laboratories would propose to develop those instruments. They would finally be awarded those contracts, build those instruments, integrate them into the spacecraft, and NASA would launch the spacecraft. The instrument would usually operate for as long as NASA tracked a spacecraft.

Next, NASA received the data on the ground through electromagnetic waves from the spacecraft, then put it on the magnetic tape and sent it to the investigator. What we find between 1960 and about 1980, is that these principal investigators would build their own facilities at universities. These were analysis facilities, and in that time period, the types of analysis facilities we are talking about were very much batch-oriented computers. Scientists would write their programs, create a card deck, submit it, and wait at the window for their output. That is how they would interact with the computing center. As time went on, that interaction loop was very difficult for the scientist.

Scientists then looked for ways to make their jobs easier. Getting access to the data at that time was difficult. The information about the data, to decide what tape you wanted, was usually written on the label. This data started at a certain spot on the tape and stopped at another. That is how a scientist knew about what was on that data tape, rather than having direct knowledge of the instrument.

That knowledge did not usually get to the other scientists who needed it. It only came about by publishing. Scientists would work on the data in this way, eventually, many of them would develop their own computing facilities. Then the interaction would increase and they would be able to get access to the data and write more scientific papers. More scientists in the world community, then, would know what the instruments were doing, the kind of measurements that they were making, and, of course, sharing the excitement of the discoveries, which during this time period had been quite remarkable.

How would the scientist interact with the library? He would go downstairs or upstairs and walk into the university library and browse through the card catalog looking for additional information that would help him analyze the data. The data were off-line, the information was off-line, the library was off-line, meaning there was no electronic access.

As he would create data and information about the data at his local institution, he would send that processed data to the National Space Science Data Center at Goddard. Over the last twenty-five years, we have collected about six terabytes worth of data, in other words, we manage 102,000 data tapes that would easily fill this room.

In the 1980s, we saw a tremendous revolution happening in computer technology. Instead of the scientist writing a deck of cards and taking it to a window, he sat behind a terminal, logged on to the computer, and developed his program electronically rather than through the systems operator. Interactive computers began to change the way scientists work.

The next thing that happened in the early 1980s, particularly at NASA, was that these pockets of scientific expertise, with their own programs and their own data, began to connect to one another. NASA, starting in 1980, undertook a program to interconnect as many of these research facilities as they possibly could. This is the Space Physics Analysis Network, one of two major NASA networks.

The other one, the NASA Science Network, has about half as many connections. This is a NASA owned and operated communication plant. It connects these universities together, and the scientists then have easy access to the computers of other scientists. Those computers are the ones that are processing those scientists' data. Rapidly, scientists found out that just accessing somebody else's programs did not mean they understood the data, did not mean that they could do anything with the data. Much more information about the data began to be extracted and then presented to the users.

Also during this time period was the explosion of local area networks. A lot of these interactive computers in a particular science facility needed to talk to one another. The technology of local area networks allowed one to clamp on a wire, and everyone clamped on this wire, and now all the computers are talking to one another. With a connection to the computer room, that brought up every one of those computers on the wide area network.

Although there are only 150 lines here in terms of communication links, there are over 3,000 computers. A lot of these centers, like NASA centers at Goddard, Marshall Space Flight Center, Johnson in Houston, Jet Propulsion Laboratory in Pasadena, have many hundreds of computers connected to the local area network. In addition to that, also in the '80s, NASA was reaching out to the other space agencies. There are now several fast "pipes" or wide band-width connections that connect NASA facilities in Australia, where they launch rockets and balloons for a variety of programs, and also into Japan and into Europe. These are key points where there are major space and earth science spacecraft facilities in neighboring agencies. ISAS is the one in Japan, and ESA is the one in Europe. Each one of these has its own networks within the region. ESA, which is made up of about twelve or so countries participating in the space program there, have a major network called European SPAN, for historical reasons. With that one connection, all the computers and the scientists associated with those are connected within the NASA framework.

The National Science Foundation has quite large networks and very large band widths and has connected all their departments together. The National Science Foundation Network or NSFNet is inter-networked with both Span and the NASA Science Network. These interconnections allow more connectivity to the general university population and pick up scientists that NASA wants to be able to have access to our facilities.

There is one other thing I want to say about computer networks before I move on to how we manipulate information about data in these computers. There is some infrastructure that you must have, and that is computer security. There are always problems with people trying to get into facilities. The National Science Foundation and NASA have security groups that monitor and manage these networks and make sure that they are appropriately used. As you can see, NASA has its own network that is connected to NASA scientists or scientists that have direct relationships with NASA centers. University communities are connected, psychology departments, geology departments, and they have the general education network. There is also another network called BITNET that connects many more universities than the National Science Foundation network. These smaller universities and colleges may not have the major resources to become NSF members, so BITNET is connecting them, and it is also worldwide. These networks have clients; if you want to connect to a network and provide library services, you need to know your clients.

Just because NASA's networks are interconnected with the NSFNet does not necessarily mean the ability to log on to a facility and get access to it is as good on one network as it is on another. How one wants to connect a network depends upon the types of clients that you are reaching.

During the 1980s, there was an explosion of online data systems. This came about because commercial products in the database management area became available that allow one to create databases and then query the catalogs of information, the inventories of the data that you hold, not only at the National Space Science Data Center, but at other locations.

What has happened, then, is that a number of data systems are reachable over these networks. In 1985, before I became the head of the data center, we received about 3,000 requests for data. There were three ways to do that: send a letter, pick up the phone, or walk in the door. Since 1985, I began getting much more connected with these computer networks. We have developed eighteen online interactive systems that cater to the individual disciplines that are involved in NASA Space Science Research.

There are a couple that I want to dwell on; one is the master directory. When the users log onto that, they get a high-level overview of all the data in our archive and, in many cases, data in other archives. There are data systems in astrophysics, earth science, space physics, and there are some general networking online interactive systems. In these, there is always information about the data that they point to, but in many cases there is also the data itself. As I mentioned, we have about six terabytes worth of data, but only about a tenth of a percent of that is online. As we go along, more and more data from the National Space Science Data Center will be online. What scientists want to know is where data exist.

These types of information systems are providing that capability to inform the user where to go to get it. In 1989-90 we had 13,000 requests for online access to these systems. Besides providing just the right information that users want, and they want more of it, we are also open twenty-four hours a day, seven days a week. A student at 2:00 in the morning on Saturday can log onto one of these systems, get access to this information, figure out where the data is, send us a request for that data electronically. Then when we open up Monday morning, we can get it.

Better yet, if the data are online, and it is not a lot of data, he can have it immediately. We have put a number of large databases from certain spacecraft online. One of these is our International Sun Earth Explorer. Not only is there information about these data, but the data are also online. So, after he looks at the information, he makes a query: I am interested in stars in these regions, or whatever, and it comes back, and it says there are five observations, and he can order them. The data can be provided. Right now in today's wide area networks, you can get network images within minutes. In a matter of thirty seconds to a minute, we can move any one of the IUE images to Europe, Japan, or any place in the United States that is covered by SPAN or NSM.

Commercial database management systems are now being used as database management systems with space and earth science data, or information about these data. You just cannot go buy one of these things off the shelf and apply it to the NASA environment. There is a lot of software that has to be built on top of that, especially user interface software. When the user makes a request, it is looked at and a number of what are called sequel queries are generated automatically and given to the database management system, and then the output is brought back to him.

Another thing that has been extremely important within the NASA environment is getting those data to the user after he wades through it, and he orders it. We will network it to him, but other ways are through new technologies in mass storage. The first one is a WORM optical disk. WORM stands for write-once, read many. On this one disk, we can hold about twenty of those data tapes I was talking about. Even this is now old technology. The new ones are up to about 6.5 gigabytes, or about eighty or ninety data tapes worth of information. Nearly half a rack of space and earth science data can fit on one of these.

It takes a lot of money at the other end to be able to read this. A lot of computer systems now have changed to use cartridges. A 3480 IBM tape cartridge holds about the same volume as a magnetic tape. The important media that I want to mention are CD-ROMs (Compact disk-read-only memory), which allows us to provide a tremendous amount of high-quality NASA data in a very small medium and reach the users in the PC environment. To have the associated information about the data and the data themselves, this is an excellent way to go.

Let's talk a little bit about one of these online systems, the master directory. How does NASA organize information about data to give to users, and where does the library fit in? What we are seeing is that the library information that is now becoming extremely important to scientists, just like the information about data, is not yet readily accessible on these networks. The scientist sits at his work station and he can log onto data systems all over the world and get data back either through the network or through the mail. He can order it very quickly, and it is much different from the 1980s, when you had to fly to the institution to get it, or you had to read the journals to understand what was happening.

The directories that are online cater to a variety of disciplines, like astrophysics. You log into it and it asks you what information you are looking for. If you are looking for these stars or this type of galaxy, it passes you into the information about those instruments and data, and then the inventory. Then you can reach the data. Some of these data are not at the National Space Science Data Center but at other locations. Those other locations can also be connected. In fact, in the Master Directory, once you've identified a piece of data that is not there locally, you can say, "link," and it will log onto another computer in another location where information is much more extensive about that data. What we are seeing, then is a way that the users approach these systems, logging into the local system that can go to either the data center or to the master directory, and selecting a set of data.

What has come up for the 1990s? More of the same, except we are almost in a frantic period because we are trying to get ready. There is going to be an explosion of data volume in the '90s. There have been tremendous advances in instruments, high data rates, on-board storage systems, faster light-qualifying computers, new techniques and devices, and a large number of launch missions.

From 1988 to the year 2000, we have forty or fifty new missions a year. This is going to generate a tremendous amount of data. These online information systems are going to be more important, and information about that data is going to be more and more important.

NASA is supporting more disciplines. We used to support mainly astrophysics, earth science, planetary and space physics. Life science is coming into the arena, along with microgravity. NASA is going to step up the new Presidential initiative to go back to the moon and Mars. Then we have got to know much more about life in space than we do now. That is a new discipline. Microgravity, the ability of form crystals in space, is also extremely important.

If you think we have got large data files now, with tens of terabytes in these archives, in the future we will have hundreds and thousands of terabytes. The mass storage systems that will be able to handle this are now starting to come online--low-level record management, automatic robotics. The information about these data is extremely important too. We need to link this information with the library, with the science literatures that come out. Right now, as I mentioned, it is not done routinely on these networks.

The bottom line is that the major revolutions in computer technologies, wide area networks, local area networks, work stations, and PCs are being used very effectively by scientists to gain more information about the data and even access to the data. We will see much more of that in the future.

A number of computer science techniques are being developed now, for example, expert systems which one would log on, asking for all the data from a particular tectonic plate moving in one direction or another. The expert system has to understand English, convert that into a computer science code, submit that to the machine, and bring back the information. These expert systems now are starting to appear on the networks. We will see much more of that. Another new technique in computer science is called neural networks, the ability to create a program that learns. It reads data and creates information about that data. It can tell you the percentage of asphalt in a Landsat Image to within ninety percent of assurance, or the amount of cloud cover, or the amount of force. Once it starts looking at more and more images, it begins to learn and is able to extract and manipulate information. That information is promoted up into the data systems. Extracting information about data is extremely important, and then providing that to the right network of science users. We will see more of that in the future.

Elmer Smith
Canada Institute of Scientific and Technical Information

We need to pick a word to identify why STI is assigned the way it is in Canada. That word would have to be "pragmatist." We are a small country in terms of population, but we are a large country geographically, 5300 kilometers east to west, 5000 north to south. We have a population of about 26 million people, but ninety percent of those people live within 150 miles of the U.S. border. We have two major provinces, Quebec and Ontario, which dominate the country. We have areas of economic disparity, mainly on the east coast, and to a degree in other parts of the country.

Canada is trying to eradicate those areas of economic disparity to the point possible. That means that any system you use for national services has to be available on a cost-equalized or rate-equalized basis from coast to coast, and it also has to be available in both English and French. So the pragmatism that directed us to perform the way we have performed, to design the way we did design, comes from the recognition of the geographic and demographic reality of Canada.

We looked at a system that is federally supported through an institution called CISTI, part of the National Research Council of Canada. The idea in developing CISTI was to complement and supplement the local collections in various universities and other information organizations across the country. We house this service in Ottawa. CISTI has several branches across Canada, but they are there primarily to serve the needs of the research and development community, and they have a few local interfaces.

We break down the CISTI services into three principal components. We have a large acquisition budget of about $10 million (Canadian), limited to science, technology, and biomedicine. The document delivery aspects, which derive from that collection, would be on the order of 450,000 transactions per year. We have a series of access mechanisms such as DOBIS, our Canadian online inquiry system, and our SDI--selective dissemination of information--technique.

Over and above that, we have scientific numeric database programs, which call for the dissemination of validated data, not in the bibliographic sense, but validated data to scientists across Canada, and that predictor service also functions internationally.

CISTI, then, is the principal science and technology information center in Canada, but it recognizes that there are other organizations that have very valuable collections in specialized areas, such as Agriculture Canada, Environment Canada, Energy Mines and Resources, Fisheries and Oceans, Geological Surveys, and so on. These departments, by and large, were established well before the National Research Council was established.

The National Research Council got responsibility for the Science and Technical Information Network by virtue of a variety of events, the most important of which, unfortunately, were the two world wars. The National Research Council was formed initially to provide science information to the government of Canada to support the military activity in the First World War, although it did not have any laboratories; it was very much like the International Science Foundation in the United States. In the Second World War, it developed a large number of laboratories that worked directly in support of the war effort.

How does CISTI function in the Canadian environment? First of all, it acts as an information transfer agency by developing and operating services that link other services together. One of the best examples of this is the Union List of Scientific and Technical Serials in Canadian libraries. This links some 350 participants across the country. We do not have the authority to tell any participant, "You must contribute to this." Participants contribute to this network simply because it is considered to be to their advantage and to the advantage of other Canadians.

Our Scientific Numeric Database Network is a totally different thing. This is a network which is operated by PhD-level scientists. They are crystallographers, physicists, physical chemists, thermodynamics experts, relating to very small communities across the country.

These are scientist-to-scientist networks established within CISTI. It acts as a coordinating agency, assisting in the joining together of these voluntary networks with other suppliers, such as our online activities. We have a Canadian online system that not only provides access to some 35 million records of scientific and biomedical interest, but is connected to a document-ordering system, so that when a user identifies a citation of interest, that individual can order material electronically through an automatic call-numbering system linked to computerized files.

The first content of the online system is the commercially available database, such as *Chemical Abstracts*. The second component would be the small Canadian database that no other system would be able to mount. You do not make any money on that one. They are small, they might be 5,000 to 10,000 records, and they would not be available to any other national system. We have about eighty percent of our activity coming from the commercially available data bases. The other twenty percent would be these uniquely Canadian databases.

We have another system operated in a batch mode, but it could also operate as an online SDI (selective dissemination of information) service. This is a very valuable way of keeping scientists informed about what is new in their field. We work with the private sector and with the research representatives from Canada who are in the private sector. They might disagree a little bit, I think, with that statement. We work very effectively with Bell Canada. Many of the developments we have come up with, in terms of ways to communicate information quickly across the country, the development of protocol, and that sort of thing, were developed with Bell Northern or directly with Bell Canada.

Why do we exist the way we do? In Canada, there is not any other single institution, other than the federal government, which could afford to spend the money centrally to provide the kind of collection and access services that CISTI is able to provide. Our user profile is in excess of sixty-eight percent in support of the industrial sector. The other less than forty percent comes from all levels of government and from the university sector. The university sector would account for about fifteen percent of our total workload.

We support industry directly. We go through a lot of bureaucratic procedures when somebody wants to borrow something from us. That individual does not have to come through a library. That individual can be working in an office in his own home, and he can come directly to us. Unfortunately, one of the things he has to do is pay for the material that he gets from us, and that is a contentious issue.

What does the future look like? We are having real problems with economic constraint, and this may well be a significant weakness of the centralized system because when you put the squeeze on the centralized system, it is only a question of time until all of the people who have learned to depend on it start feeling the pinch. If it were more decentralized, perhaps that would not be quite as severe as it is going to be in the case of CISTI. Faced with that, we have to put more emphasis on the sharing of resources in Canada.

We have a serious threat, and that is the cost of our operations. We have to recover the costs to a greater degree than is the case right now. We charge now for our online systems, we charge for everything that has to do with the user part of CISTI. Everything having to do with the acquisition of the material, the storage of the machinery of records in the computer, and all that sort of thing, is absorbed by the Government of Canada as part of the public-good function.

From the moment the client connects with the system, what is known in Canada as the infrastructure part, the client pays. Clients pay for document delivery, for selective dissemination of information, for use of the online inquiry system. While they might not agree with this, the amount they pay is less than the commercial rate because we subsidize it. Our online rate is roughly half of what DIALOG charges. But this subsidy is available to Canadians only.

There is a document entitled "National Information Policies," a review of the situation in seventeen industrialized countries. This was prepared by Michael Hill, who was then president of the Fédération Internationale de la Documentation (FID), and I do not think it has been published yet. The countries involved in this study are Australia, Austria, Canada, Czechoslovakia, Denmark, Finland, France, Germany, Hungary, Japan, the Netherlands, Norway, Poland, Spain, the UK, the United States of America, and the Union of Soviet Socialist Republics. This report goes through the policy, and then explains it.

The Japanese model is quite similar to the Canadian model. Japan sent delegations over and looked at the CISTI model and the NRC model. The reporting relationships, the level of the activity within the Government of Japan, is a little bit higher for STI than it is in Canada. But their JINCS, which is the principal scientific and technical information organization in Japan, is comparable to CISTI. The major difference is that they do not have the collection that we have acquired over the years in CISTI.

Robert Zich
Library of Congress

When James Billington became Librarian of Congress in October of 1987, he began an intense scrutiny of all parts of the library, including parts that had not received all that much attention in earlier years. He discovered a number of things, some good, some bad. One of the good things that he discovered was the richness of resources that existed in the Library of Congress to assist research for science and technology. There was, for instance, a very sizable technical report collection, more than three million items. There were materials, however, in our management division, for historical scientific research, which were very little known.

This caused him to start talking about some of the possibilities for the Library of Congress. He indicated in his first speech to staff that he wanted to do some inward-looking things and some outward-looking things. One of the inward-looking things was to find ways to exploit our resources, particularly LC's lesser-known resources, much more effectively and widely. Outwardly, he wanted LC to be of broader and more effective service to the nation. These aspirations have received different kinds of embodiment.

He talked to people like Robert Mosbacher, the Secretary of Commerce, some leaders from NSF, and others about what he had discovered in the library that had surprised him. Well, these discoveries surprised other people, too. The Librarian explored what the Library of Congress might do--to use the earlier language of the project--to create a national library for science and technology. (But we no longer talk of a national library for science and technology: we became more modest in our language, once we discovered how effectively many things were being done by a number of other institutions.)

Dr. Billington came for help to the Special Projects Office, an office which he had recently established that conducts its work by creating teams of staff members from all parts of the institution. He asked for a Special Project team to look into what new initiatives the library could sensibly take in the way of STI services.

Let me say parenthetically how such a team is formed. First, the Special Projects Office drafts a mission statement. This mission statement goes to LC's management team, the top officers of the library. If they approve it we proceed and send out a call for volunteers. The call appears in our in-house publications. Staff fill out applications and explain why they think they would be suited for this work.

In this particular case, we received seventy applications. We sought people not only with special qualifications in science and technology, but others who could participate in this enterprise as part of the training exercise. We went from seventy people to seventeen, and it is those seventeen who make up our present team. We first had to identify a team leader, and we were very pleased to be able to get the library's new Director for Scholarly Programs, Prosser Gifford. Prosser is leading that effort in cooperation with the Special Projects Office.

We sat down with this team, got approval from management for our work plan, and now we are proceeding. This work plan has three phases. The first phase is information gathering. We had as our first task finding out exactly what was in the LC collections and what LC was offering in the way of science and technology information services. That investigation in itself was a considerable chore.

We had the team put together a statement about what the nation's STI commercial information services were doing and have that outlined fairly well. We identified pertinent federal institutions, got in touch with them, and visited them on many occasions--places like the National Agricultural Library and the National Library of Medicine. We did not want to duplicate what other people were doing well. We have been talking to the National Science Foundation, National Technical Information Service, and others to collect information about what is being done now by the federal government. We want to find out about international institutions as well.

After having investigated existing services, we saw that we would need to do some traveling to sit down with people in their home institutions and get a better picture of exactly what was being done. We were happy to get a small grant from the Sloan Foundation to support travel to institutions like MIT, and to bring some information sources to LC. We will be visiting CISTI, MIT, RLIN, OCLC, Bell Labs, the New York Public Library, Engineering Institutes Library, and others to get a full and rounded picture of what is being done now, and what the plans of these organizations are for services in the near future. We hope especially to discover what gaps they perceive as existing in the field of science and technology information services that the Library of Congress might sensibly be able to fill.

Once we have completed our consultations, and we hope to finish that by the end of November, we will pull together some preliminary recommendations. We expect to convene a national advisory group, perhaps ten to twelve people, who will sit down with us, and help us polish these recommendations to make them most useful to the nation.

At the moment, we see the recommendations that we will make falling into three broad categories. The first category has to do with strengthening LC's STI infrastructure. We have to beef up LC's infrastructure before we can effectively offer service to other people. The library's resources are impressive and it does house good people, but not the full array of them nor the support structure needed for full functioning. LC will need additional help, particularly automation help, to make its rich resources effectively available to other people.

We hope to strengthen this infrastructure. We hope to fill the collection gaps we have uncovered. Even though LC has three million technical reports, there are quantities of other technical reports that we should have. Even though we have the standard publications, we do not have all the standard publications we should have, and so on. We are determined to identify what these gaps are and try to fill them.

Second, we see a need for a new kind of technology information resources file, information about what information exists in other places. In our investigations, we went to one of the organizations that Dr. Green described earlier, the Master Directory operation that NASA runs. We were very interested to see what it did, since that service is in the business of getting out information about information sources. While we were there, they mentioned there were twelve other organizations that were doing the same sort of thing or were about to, and we needed to know about those.

Though much was being done, there were still gaps LC could fill in the network of information about who is doing what -- and equally important, a master file of other directory sources. Data like this in a good machine-readable file, we believe, would be of help to everyone. LC would use such a file internally, and I hope would be able to make it available in machine- readable form either online or as a CD-ROM publication.

A third preliminary conclusion is that LC should offer services for a fee that can supplement the kinds of services that we have traditionally offered. Obviously we have been, from the inception of our institution, offering the best service we could as cheaply as possible or, ideally, with no cost whatsoever to the user. The question is, "Do limitations on what we are able to do without charge leave us with a need for an extended service that would have to be supported by fees?" The extended service would obviously be in addition to our traditional free services. We are determined to maintain as free services all those services that we have traditionally offered free. I am inclined to think we should offer an extended reference service on a fee basis.

In the course of the next year, fiscal year 1991, we will be conducting some pilots to determine whether our ideas truly have merit when put into reality. We will probably be doing pilots to test three LC science initiatives. All three might get support, from a Michigan donor, that would permit us to strengthen our resources, establish a new information-about-locations-of-information files, and provide seed money for an extended fee-based reference service.

In 1991, we will also explore various linkages with the National Technical Information Service. We have had several informal conversations. There seem to be possibilities for linkages that would be fruitful for both institutions across the range of library operations. The Library of Congress has a very extensive network for acquisitions around the world. NTIS does not, although NTIS is quite interested in the extensive scientific and technical literature that exists in other countries. NTIS has taken initiatives in a few countries, but has a very broad interest. It is possible we would be able to use our acquisitions machinery to get materials they would not otherwise be able to get easily. We could send to NTIS both new things and things we have now that they do not have. They could copy material to microfiche or, in the future put it in machine-readable form and then provide an index record.

The Library does not now have a good record of the individual items in most of its monster collection of technical reports. NTIS would send us the fiche and the records for items we supplied them, and we would be able to use these for our in-house services to Congress, and they would be able to put them into the national system for distribution around the country and the world.

We also see a possibility for a cooperative reference service. Right now, NTIS does not offer a reference service. If you ask them what they have on polymers, they will send you a letter saying you will have to find out from somebody else. In the future they could forward those letters to the Library of Congress, and we would be able to do a search not only in the NTIS files, but in others, and provide inquirers with the information they need to have in order to find the documents that would be useful to them. These are some of the possible cooperative services with NTIS. We are also talking with a Japanese foundation about putting a Japanese information center in LC with a special focus on STI.

We are highly conscious of the fact that more and more people are becoming interested, not in catalog or index information, but in the item itself. Of course, people have always been interested in that, but now we have new tools that make it possible to link records with the item itself much more effectively.

The American Memory Project distributes on CD-ROMs and video disks not only catalog records, but an electronic copy of the original items themselves: pictures, sound, motion pictures, texts, and so on. We are sensitive to the copyright issues that emerge. I am happy to say that Ralph Oman, the Register of Copyrights, is eager to involve himself in a rethinking of copyright law as it applies to the new world of electronic dissemination of information. Both in connection with American Memory and possible new science and technology information services, he is going to join our conversation to see if there is new legislation that is needed to facilitate all the desirable possibilities, while being fair to all parties. Concern for copyright is a part of the science team brief as well.

I am delighted at the opportunity to give you this progress report, but that is all it is. We do not yet have any firm conclusions. We are very much in the business of talking to knowledgeable people about what science information services are needed in this country and about the issues. We are eager to hear your ideas.

Martin Cummings
Council on Library Resources

Historically, the Coucil of Library Resource's National Science Foundation (CLR-NSF) study was inspired by an interest expressed by the National Science Board, the highest governing body of NSF.[1] At recent meetings, they indicated an interest in learning more about trends in scientific communication. Particularly, they were interested in learning whether there were new measures or indicators reflecting how American science was performing. This request was directed to the Science Indicators Directorate, who, in turn, asked the Council on Library Resources to study this question.

We called together some of the nation's leading research libraries and science administrators, scientists, a few science editors, and others, and asked the group to help us construct an accurate picture of the current American infrastructure serving science and technology, particularly physical sciences and engineering. We asked for help to identify problems that needed better understanding before NSF could undertake any program development. I am going to summarize four or five points that grew out of the main conference and several subsequent smaller conferences.

The dominant theme of all of our meetings is that there is a need for a new comprehensive study of the information-seeking behavior of modern scientists and engineers. We can no longer fall back on old studies based on science and engineering use of more conventional means of accessing information. As a result of that pressing question, the CLR commissioned a report by Dr. Helen Gee to develop a methodology for a national study of the information-seeking behavior of scientists. She sought the assistance of a small multi-disciplinary group. First, a careful design prospectus was prepared, under review now by the National Science Foundation. Second, the group believed that there was a need to study new roles of research libraries in meeting the changing needs of science and education. This was something that the Council was very keenly interested in, and it promptly commissioned a preliminary study by Nancy Van House at Berkeley, in which she made an effort to seek correlations between research library resources and research productivity in universities.

I will boil down the principal finding because all other efforts to find correlations failed, with one notable exception. She found a moderately high correlation between research productivity on university campuses and the number of reference or research librarians that existed on that campus. I do not want to interpret that finding, but I think it is one that deserves your further attention. We have encouraged Dr. Van House to do more elaborate studies because of the obviously great potential interest, not only by you as science library directors, but by your institutional leaders as well. There was an expressed need for further studies of the economics of library services to scientists and engineers comparing, perhaps, the services provided by academic libraries to those provided by industrial or commercial libraries.

With regard to the very interesting report from Bob Zich, there was an expression of interest on the part of some at our conference that there may be a need now for the creation of a national library for science and engineering. Two views were expressed as to how this might be accomplished. If our nation needs a national library to serve science and engineering, it might be created through an arrangement between the Library of Congress and some of our nation's leading science libraries. It was thought in the light of modern information technology and rapid communications, such an arrangement might be the most economic and efficient way to create a national library system to serve science and engineering. The creation of a central library, such as the National Library of Medicine or the National Agricultural Library, or the Canadian model (CISTI) is also recognized as a promising approach. There is a lot of analysis required to compare these two prospects.

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[1] *Communications in Support of Science and Engineering, A Report to the National Science Foundation from the Council on Library Resources.* Washington, DC. August 1990.

There emerged as an important issue the concern that new mechanisms of publication, particularly electronic publication, may seriously affect the library's ability to organize and maintain bibliographic control of the scientific literature. This problem was discussed here several times yesterday, and people outside of the library profession are beginning to recognize this as an important problem.

It is very important for ARL members to keep abreast of new developments in these areas. I am heartened by the fact that the National Science Foundation has reawakened interest in research libraries. They, for many years, had a keen interest in science communications and science libraries. This interest declined for a couple of decades, but it has reemerged recently. I think this is a very wholesome development for the nation. I believe, from my contacts with the staff of the Science Indicators Directorate, that you will find them knowledgeable and very much interested in your views. So, I urge you to seek opportunities to let NSF know what you believe is in the best interest of our nation.

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MR. LUCKER: As part of the CLR-NSF study, the MIT Libraries and Bell Laboratories in New Jersey have agreed to participate in a joint study of the relative cost of providing information to scientists and technologists in industry and academia by surveying expenditures from both industrial research laboratory libraries and a group of academic libraries with strong science and technology interests.

As you might expect, MIT is doing the academic library piece, and Bell Labs is surveying some thirty industrial organizations. We hope to do a report comparing the relative expenditures for scientific and technical support in these two environments. We are using for academic libraries ARL and ACRL data, and for the industry a survey. It will be anonymous, by institution, as part of the agreement that we have with the industrial laboratories. We hope to put this out within the next six months.

MR. GHERMAN: I would like to bring up something of interest that I do not think has come up yet this morning. We have found at Virginia Tech that demand exists out there. We have put together a model with which we are looking at technology transfer to small businesses in Virginia. How do we get the information? It comes from our research lab for small businesses, with their increasing need for high technology. In doing this we have found an overwhelming need, and we have had overwhelming response from our university to do this. But what we also find is that there is no structure behind our library, as there is in agriculture from the National Agricultural Library, no federal agency to which we can turn. They could pull together the existing information resources, especially internationally. Is there some vision to create extension agents for high technology in this country at the Library of Congress?

MR. ZICH: That's interesting you should make that remark. The donor from Michigan who may be helping us is interested in exactly this sort of thing. He is a great champion of entrepreneurism. He, as an entrepreneur himself, made $300 million by the sale of his company. He is trying to establish an entrepreneurial work station and library to help the small business person who is just getting into business. He encountered the same sort of problem that you did--not enough resources, but said he'd give some money so that the Library of Congress can set up backup services for the kind of entrepreneurial information service he would like to offer. Obviously, we would like to extend the service beyond the needs of just this one person, to organizations like yours. But we need to have more precise information as to what exactly these needs are, what kind of information is going to meet your needs.

We have heard, for instance, an expression of a need for a good central collection of standards documents. I mentioned standards earlier because it does seem to be a problematical kind of literature, but one in which we are rich. We need to finish that effort and make a first-class standards collection, and make that information available to you through facsimile, computer, photocopying, or whatever. Put your thoughts on paper and let us know the kinds of services you think we could offer that would be useful to you.

MR. SMITH: Our user profile at CISTI is sixty percent industrial. Of that sixty percent, a good eighty percent are small- and medium-sized industries. The way we get around the kind of activity that you've just described in your organization is through a program called the Industrial Research Assistance Program, operated by the National Research Council. It functions coast to coast and has about 375 employees in the network in all parts of Canada. These people go out from regional networks to the small industry, identify what are their information needs or their technological needs, and communicate that back to the central headquarters.

If their needs can be met by scientific literature, the request is directed to CISTI. If the need can be met only by scientific expertise, the request is directed to the laboratory people either at the National Research Council, elsewhere in government, or in the industry in another part of the country. There could be experts, for example, in a private company who would be asked if they could help solve a problem. It is thus a totally integrated network, which not only has the capability to provide STI but also the capability for interpretation of that STI with respect to a specific problem.

MR. LUCKER: Some of us remember the time back in the 1960s when the U.S. Department of Commerce had a series of programs in the States to provide for the establishment of state referral agencies for science and technology for small business.

A PARTICIPANT: I want to ask Dr. Green about the six terabytes of information on the 100,000 reels and the new forms. Do you ever worry about the preservation of that material, the archival durability of it?

MR. GREEN: Yes, we do, but we are finding now that if you treat materials properly, preservation isn't the problem. The problem is that the technology is moving so fast that data written twenty-five years ago is now unreadable because the old hardware to read it on has not been archived. The media we are using are already outliving the technologies for reading the material, so you need to put into place old data restoration, in which the data is constantly in the process of being reformatted to newer technologies.

UPDATE ON SERIALS PRICING AND LIBRARY RESPONSES

Introduction

MS. NUTTER: I am here as the chair of the ARL Collection Development Committee to moderate what we hope will be a very informal discussion on the current state of serials pricing, as well as a description of what is taking place in ARL libraries in response to that state. This is an opportunity to provide you with a quick update and to give you a chance to share with us what strategies you are employing on your campuses or within your communities.

The committee has asked Ann Okerson, director of ARL's Office of Scientific and Academic Publishing, to provide a context for this discussion by beginning with a report on recent developments in the serials pricing arena and current activities of the office. She will be followed by Joe Rosenthal, at the University of California-Berkeley, who will describe his idea and efforts to develop a database of academic editors of major scholarly publications. Paul Mosher from the University of Pennsylvania will discuss efforts by some ARL members to develop serial stabilization funding. Then Paul Gherman of Virginia Tech will describe a project by the Association of Southeastern Research Libraries to develop a union database of member serials holdings, prices of those serials, and cancellation plans of the different universities. I will then follow up with a report of a recent symposium seminar of editors of refereed electronic publishing projects that was convened jointly by ARL and my own university.

Ann Okerson
ARL Office of Scientific and Academic Publishing

I will start with some interesting developments on the legal front, which directly or indirectly bear on serials prices. There are four very interesting legal actions which are occurring at this time. One of them is Gordon and Breach. As you all read in the recent ARL newsletter, the West German courts dropped the lawsuit, maintaining that the American Institute of Physics and Dr. Barschall were not advertising or competing. The day that result was filed, the Gordon & Breach lawyers mounted an instant appeal, which at this very moment is being heard in West Germany. We do not know the outcome of that. The other court cases in Europe are proceeding.

A very interesting situation has occurred, also in West Germany. One Dr. Dorpinghaus, who is a mover and shaker in German library acquisitions and has been very active on the serial pricing, was strongly objecting to an action that Pergamon Press took four or five years ago. Pergamon Press had, until about '85 or '86, operated with one British pound price, which was then converted variously into different countries' currencies with, perhaps, some add-ons for extra distribution costs.

Around 1986, Pergamon maintained the pound price for British publications and priced publications to the rest of the world in Deutschmarks, perceiving Deutschmarks to be a stable and uniform currency. That had the immediate result of raising the main-line European prices considerably higher than the British pound prices. Dr. Dorpinghaus, on behalf of his group, filed action in the EEC court in Brussels one year ago, claiming unfair price discrimination. It is my understanding that there has just been a ruling on that within the last two weeks, and that the EEC court has declared the Pergamon dual pricing to be discriminatory and illegal.

What that means, I am not yet sure. We are waiting to see a copy of the ruling. We have to remember that the EEC environment and the European laws are quite different from ours. When we see the rulings, we will know if we have something that can be pursued here and whether this would set any kind of precedent that might be useful to American libraries.

A third lawsuit that is interesting is the Kinko's lawsuit. Essentially, the Association of American Publishers filed suit on behalf of eight publishers who contend that Kinko's was unfairly reproducing materials. "Unfair" meant that appropriate revenues were not returned to publishers. That trial began in Manhattan on September 12. All the verbal presentations have been done, and there will be written depositions and summations. A ruling is expected in February. The case has gone from one of unfair or improper compensation to one purely of "fair use." When briefs were presented, it turned out that the size of the classes for which copying had been done had been very small. In one case, the class had three students. The judge has decided that this is not a matter of compensation but entirely of fair-use. That will be very interesting for libraries.

The final thing in the courts that is significant to us is the American Chemical Society vs. Dialog suit. That centers around whether information developed by the American Chemical Society, partly at government expense, ought to be available to other information distributors, such as Dialog and other for-profit companies. The reason this one is interesting is that it starts posing the question of when not-for-profit becomes for-profit. In Columbus Ohio, the ACS has been challenged in terms of real estate tax on its not-for-profit status. The challengers there said "this is a $69 million-a-year company; this is a large information producer; this is not the Boy Scouts of America."

The question becomes, when is the not-for-profit designation a kind of fig leaf for for-profit activities? As we see more collaboration between the for-profit and not-for-profit sector (such as universities with biotechnical companies; or Merit and MCI forming to combine ANS) we will see these kinds of questions increasingly raised.

We sent out a survey in early September asking ARL libraries the following question: "In view of the proposed and announced price increases for scholarly publications, particularly international journals, at levels of twenty percent and above for 1991, what is your institution doing to cope with its monographic purchasing and its serial purchasing? Are you making cutbacks?"

At the time I wrote the summary article, which will appear in the next ARL newsletter, we had responses from eighty-five libraries. I have since heard from about six more. They are quite consistent. Monographic cuts were anticipated by forty-five libraries, out of eighty-five--over fifty percent. Eleven directors said, "I do not know yet, I am not sure." The remainder said, "No cuts at this time." The ones that gave us an indication of the size of cuts to monographic budgets said anywhere from 10.6 to 27 percent cuts in book purchasing. Serial cancellation projects were being effected in forty-four of the eighty-five libraries: again, over fifty percent.

Nine resonses were, "Maybe, I do not know yet, I will not know until after October." Nine of the libraries were looking at the most expensive titles and at the most expensive publishers as the first place in which cuts were being made. Twenty-seven of the forty-four libraries told us the size of their cutbacks, ranging from $3,000 to $425,000. The highest cuts, interestingly enough, are being made in the member libraries with the largest serials collections, for example Harvard, UCLA, and Texas. The average cancellation figure per library comes to $122,371. Those are enormous, staggering sums, probably unprecedented cuts. Canadian libraries have done comparatively well. The Canadian dollar has continued to be relatively strong, and the lowest cuts were reported in Canada. An interesting thing from the questionnaire was that none of the libraries who answered expected to ever restore previous purchasing levels. There is a sense that things have changed, and this is the new order.

Our last question on the questionnaire was, "What is it that ARL can or should do to help with this situation?" I'll just review the main requests. One was, "Tell us what other libraries are doing, a kind of general sharing of information, and provide strategies to cope with cuts." I know there are some OMS SPEC kits that deal with this. If you feel there is room for additional material of that sort, you could convey that to us.

Another request from eleven of the libraries was, "Keep doing surveys such as this one. We need to know what the general ARL arena looks like." Fourteen libraries made very specific statements, some of them in great detail, telling us to construct a cancellation database or give other information about what resources are being lost in our regions and in our country. That suggests that a useful project for ARL might be to form a small task group to look at whether that could be done, how it should be done, and whether it would be useful. A final comment from virtually everybody was, "Send us anything, any and all information that is useful."

One of the useful things that ARL and member libraries are doing is to discuss these issues in a number of arenas around the country, particularly reaching out to faculty in higher education and scholarly societies. At this time, we have gotten invitations and are on programs for research library sessions of such groups as the American Mathematical Society, in its annual meeting next January; the executive meeting of the ACLS in April; and the Council of Engineering and Science Society Executives, an umbrella organization of 150 societies. We respond to all those invitations and put together programs.

The other thing is a series of local initiatives that directors are undertaking either in their regions or on their campuses. We are working with ARL directors to help create meetings or conferences tailored to meet local needs. The purpose of these is to reach faculty and administrators who write the scholarly publications, and to increase awareness of their responsibilities as creators and owners, and to promote the idea that the universities ought to regain some control over the ownership and distribution of their own output, and that this ought to be a national agenda item.

For the remainder of this year and through spring of next year, we will be doing some of those things with the North Carolina State University system, the University of Tennessee, Johns Hopkins, Iowa State, Nebraska, University of Colorado, and others who have indicated an interest in pursuing such a program on your campuses.

MS. CRETH: I agree with the people that have indicated that we would like to hear more, but we really cannot wait for the ARL newsletters to come out. We need special mailings in paper or, preferably, in electronic format because it provides us a means for redistribution among all of the librarians within our organizations who need that kind of information as well.

If there is some way, could you send that information back to us as you keep hearing what different libraries are doing? We need it quickly. We need it to alert our own campuses and provide a national context in terms of how we are building our budgets. Right now most of us are relying on the alerts we are get from a company like Faxon. They are extremely helpful. We need the information rapidly and frequently.

MS. OKERSON: Our E-mail capabilities at ARL are at a basic level now, with several expected improvements to come over the next few months. I share Sheila's concerns. One of the reasons that we are so actively trying to pursue a scholarly communications electronic newsletter with ACLS is that such a publication would give us a quick outlet that we simply do not have yet. Your suggestion is absolutely appropriate.

MR. GOVAN: Our serials librarian is Marcia Tuttle, and she has an electronic journal devoted to nothing but issues concerning serials pricing. It is gathering readership as well as contributors. This could serve as an organ that ARL could use because it is constantly available online.

MR. ROSENTHAL: One of the things that OSAP did a few months ago was to send out a list of faculty members associated with Gordon & Breach publications, as editors and members of editorial boards or in some other capacity. Some of us have used that list, with the packet of information sent out by ARL, to contact faculty members on our own campuses to alert them to the serials theme and to suggest that they inform their colleagues who serve on publications of Gordon & Breach and the publishing office itself of concerns about pricing situations and about the likelihood that there was some unfairness going on. We have proposed that the same thing be done for Elsevier, Pergamon, and Springer.

To that effect, ARL, in combination with some of the university libraries, is collecting from title pages of publications issued by these last three publishers the names of faculty members who are editors or on editorial boards and redistributing them to all the ARL members in the hopes that all of us might alert our faculty members and suggest that they take some kind of action, if only to express concern. The big part of this job, which ARL really cannot do alone, is to get the latest issues and photocopy the names of the board members, collect them, and then get a combined list. We enlisted the libraries of Texas, UCLA, Harvard, Illinois, and Berkeley, and we will try to compile these lists.

MS. VON WAHLDE: You reported on this in May, when you first distributed the list. As I recall, you had some caveats about how to use this on the campus, or some sort of prescription about how far to go, what was legal and acceptable or what was not. Can you repeat that information? I endorse the idea of collecting and making accessible to us the names of editors or those involved. We have a terrible time on our campus trying to identify those people. That information is not kept in the provost's office in any shape or form, so this is a great service if we understand the ground rules.

MS. OKERSON: Our lawyers have said that the Association ought not collectively exhort members to a specific course of action, namely a boycott or a mass cancellation, or any such collective activities. We cannot, as a group, urge you to do that. It is up to individual members to do whatever they deem is right.

The Gordon & Breach databases were used on campuses in a variety of different ways by directors at different times, as the appropriate situations came along. I have some copies of letters; they were all worded differently. Some directors reviewed them with their campus lawyers. We may do anything that provides an information service. The directors used the Gordon & Breach letters to send to the editors copies of press releases about the legal actions, the lawsuits that were taking place, and made a covering statement saying that this is not good behavior, this is not acceptable, and if you share that conviction with me, you might wish to take some action. I think that kind of careful wording is perfectly all right.

MR. MOSHER: I think it is very interesting to hear how ARL libraries are acting to move in a variety of ways, both proactive and reactive, thoughtfully exchanging ideas and still acting individually in our interests. There are many different approaches, some of them take into account the fact that the real reason behind the extreme journal rises is the interest of publishers or information conglomerates. It is a profit-making initiative.

Some of us are concerned that it is not a business of changing the format of publishing, as long as this same set of publishers or the same set of information conglomerates are producing information. Even if it shifted into electronic form, we will be faced by the same bottom-line profit needs; and therefore we will not, in fact, be relieved of the set of pressures. We also realize that if we look back over the last twenty years or so, rather than a crisis, what we see is an irregular set of very high price increases that, interestingly, seem to happen about the same time, though the pattern is irregular.

It has seemed to some of us that it is necessary to consider this as a phenomenon until the publishing pattern changes. That may take quite a while yet. It is a regular need that we have, not only to take individual actions to identify and cut serials in discussions with faculty and administrators, but also to do something about dealing with those publications to which we feel we must continue to subscribe.

What some of us have said is that we have a certain kind of recurring crisis in a part of our materials budget, and what we will do is set aside a serials stabilization reserve. Some of us are doing so within our own libraries, like Penn, where we set aside a reserve of about $200,000, of which we will need about $195,000 this year. We put aside $200,000 from our materials budget until we have surveyed the scene with regard to serials pricings. In addition to looking at lists with faculty and cutting, we maintain this as a reserve. If we see, as we did this year, that this is another crisis year, then what we do is take whatever funds we need after cutting or other kinds of arrangements, and we cover the deficit that we anticipate. There will thus be some other initiatives that we will not take this year. Instead, what we do is just cover our serials deficit that way, feeling that, in a way, certain serials are a fixed cost of the university enterprise. If we do not need to do that, then we have already planned how we will spend that reserve.

In other cases where libraries are not as fortunate as ours, it is done in conjunction with university administrations so that there is a certain reserve set aside by the university, which can be drawn on if necessary, and if not, can go to other purposes. This is another way of dealing with the issue, and we urge you to think about that as an alternative.

MS. CRETH: You have $195,000 out of your $200,000 that you are going to use for the serials prices this year. Is the balance brought forward next year and then another $200,000 added to cover next year's serials? In other words, does your reserve continue to grow in order to meet the potential of an ongoing serials crisis?

MR. ROSENTHAL: As you know, serials are somewhat of a fixed cost. It is an ongoing implication. That means additional funds would have to be found next year. On the other hand, if we canceled, as we regularly do, money from the cancellations also goes into that war chest. So, it tends to be replenished to some extent.

MR. CAMPBELL: Hoping that we could come to some reasonable solution to this downward trend in the next few years, a stabilization fund only works for a while. We developed an endowment that returns about $130,000 a year. The real problem of funding is a one-year problem. Our budget is set this year. We get our serial bills, and they are higher than we had anticipated. So, we have a problem this year of how to afford them. We make the case that the university should pick up the added cost next year. So, that stabilization fund covers one year. It replenishes itself next year. If the university decides to cover the funds, then indeed, the stabilization fund is fully there. If the university decides it will not cover the added cost, then we drop subscriptions, and the stabilization fund is still there.

The last two years when serials did not really increase above what we had projected, the stabilization fund was available for whatever use we wanted to make of it. But that is, at best, a kind of short-range enterprise because stabilization fund or not, we only put it off one year.

MR. STUDER: We do not have a stabilization fund in place, so I must refer to ours as incipient. I wish I had a reserve capacity, like Paul Mosher does, within our own budget, but that is not the case. We thought we had a deal struck with the vice president for finance for the disastrous year we have just entered, but that person retired and the deal went with him. His successor has agreed that the principle establishing what we call a "price index" is a very good one, and we are just about ready to come to closure on a formula approach that will be put in place for the coming year.

Unfortunately, it is based on year-old data because they will only accept information from published indices. We offered to try to create some customized price indexing experience based on our INNOVACQ System, but that was not found acceptable. In essence, the incipient deal is that the university has agreed to accept a breakdown of the kinds of expenditures that we have made, in terms of domestic and foreign books and serials expenditures, and we simply take the information about how much we expend on those four categories from our automated acquisition system.

We customized Ohio State's profile, breaking it into categories: domestic and foreign books, domestic and foreign serials, and binding, which is a part of the materials budget. We have an agreement for binding that they will simply cover contract increases at parity whenever we experience a contract increase. We are using the Higher Education Price Index (HEPI) model in terms of how we present the calculation. For serials, domestic and foreign, we are getting an average pricing from special runs that Faxon has agreed to do for us. We will come up with a unit cost, and this will be what we presumably paid for an average foreign title and an average domestic title the year before. For books, we will take the ALA Index, which is formalized at the mid-winter ALA meeting almost every year. For foreign materials, there is no good aggregate index, and we have agreed to use what HEPI uses. That is the information the Library of Congress gathers every year.

The LC data have wild swings. For instance, the year that is just to be published cites a twenty-eight percent increase, which is just as ridiculous as the minus eight percent increase they reported the year before. This index does not have a very good stabilization record at all. All of this is melded together by some kind of arithmetic alchemy and comes out with an index that exceeds a hundred. As the deal is honored, the university will give us that money every year. It won't be perfect, but it will be considerably better than what we have had. Our serials are considered equipment in terms of budget categories, and we have always gotten increments according to what equipment was incremented in the entire university. For the last three years, equipment has gotten zero. So, serials particularly have suffered because of that. Our increase this year is calculated around $300,000 for serials alone. We have a document that is in the vice president's hands.

MR. WIENS: We have had a similar arrangement in place since 1986-87 with respect to our library materials budget. What we are concerned about, of course, is that no institution can afford to index a portion of its budget at rates that are far higher than the grants the institution gets. As a result, we have put into place an endowment fund, whereby the university has offered to match up to one million dollars in private donations to take the pressure off the operating budget. We have had an indexed budget in place now for four years, and I am hopeful that it will continue. But there are obviously increasing financial pressures, and we are hoping through private donations and matching funds to ameliorate that difficulty. It remains to be seen how that will work out.

MR. NEAL: We have been focusing on serials price increases, and there were some references earlier to monograph conditions. I wonder how many institutions here are monitoring the bills for monograph material that was encumbered at much lower prices. Over the last month our actual billed amounts for monograph materials are coming in thirty to fifty percent higher than encumbered amounts. This is particularly true of materials from Western Europe. I was wondering if other institutions were experiencing that same situation?

[CHORUS OF AYES]

MR. GHERMAN: ASERL is an organization of about twenty-six research university libraries in the southeastern part of the country. A couple of years ago we decided we would try to pull together a list of those titles that cost more than $200/year and develop a comprehensive list to show which ASERL institutions subscribe to them, so that as we face cancellations, we do not inadvertently cancel a unique title in the southeast.

We pulled the list together from a variety of sources. Thanks to Marcia Tuttle, it has been cleaned it up and we are at about 3,500 titles. At our meeting last spring, we decided that we would raise the price threshhold to $500 rather than $200, to reduce the size of the list.

Amazingly, from the information we have so far, there are a great number of titles on that list for which there are only one, two, or maybe three subscribers in the southeast. These are likely to be the ones that are going to be canceled because they are low-use, high-cost journals.

The list is now at Faxon, and they are looking at it. As no one is here from Faxon, I do not want to commit them, but I believe they are going to put it on Faxon Links. Subscribers in the Southeast, at least, can look at the list online and make adjustments. As we cancel journals in each of our libraries, we will have that as a resource.

Obviously, there might be some initiatives to look at this as a national program, so that we can look at these titles and see how many of our institutions subscribe to them. I emphasize, however, it is a safeguard against cancellation of a unique title that no one else subscribes to. I do not know much more about it, but I think that in the Midwest there is a similar project among some the libraries there.

MS. MORRIS: The Big Eight libraries are trying to form a union list that they will then use to check serials costs over a certain amount of money, somewhat like Paul is describing. We are not doing too well because of the staffing required to establish such a list. It began as an individual list compiled by the members, and now we are using OCLC.

MS. NUTTER: I want to describe for you a recent meeting held jointly by ARL and North Carolina State University, of the editors of the refereed electronic journal publishing or electronic publishing projects that we could identify in North America.

Ann identified ten projects, and eight of those sent representatives to the meeting. In every case, we invited the director of the library on that campus, if indeed a campus was involved. We got together to hold a preliminary meeting to talk about how ARL might serve as a support organization for their efforts. I think it is interesting that the meeting has been held, in light of the discussion that we heard this morning about science and engineering information. There will be a summary of the meeting in the ARL newsletter.

There were some striking similarities among the projects. One is that they were all from the not-for-profit sector. All but one had originated from faculty members in universities. At present, they are all text only, but there are two coming up in 1991 that promised to deliver more complicated material. All are either free or comparatively inexpensive.

The editors are generally idealistic about ownership and provide generous copying statements. Those who have already produced an issue are experiencing rapid circulation growth. What I found encouraging about the meeting was the sense we had from the participants that the real supporters of their efforts have been the librarians on their campuses. There was a sense of appreciation and an interest in pursuing joint activities.

We have a project on the NC State campus, and one of our editors spoke at a meeting a week later to faculty in the area, and he kept talking about ARL. Finally someone asked what ARL was, and he said, "Well, I thought everybody knew what ARL is. It is a very important organization." It was very exciting to see that there is a real role for us, and the Committee on Collection Development will be looking at how ARL might do more to support these projects, since that is one of the strategies that was identified in the ARL serials prices project.

The committee has decided to seek funding for a second meeting of this group. We would be very interested in hearing from you if you know of projects that were not represented at this meeting, because I think that we want to be as open as we possibly can. We restricted it to refereed projects because that is where we think we should put our effort at this time. I have a staff member who is working on a transcript of the meeting, and we also have a tape or a set of tapes available to share with anyone who is interested.

MS. OKERSON: To give you an example of how valuable libraries can be, one of the journals, *New Horizons in the Annals of Education* from Syracuse University, has produced five electronic issues and did a survey of its readership of several hundred subscribers, asking them what they did and did not like, how easy the journal is to use, and so on. The surveys went out electronically and were to be returned electronically. They concluded that the low return rate had a great deal to do with some of the difficulties of working in the e-mail environment, some of the snags, glitches, and so forth. Of those who returned the survey, thirty-six percent of the readers said that they had difficulty, at times, accessing or down-loading or working with the journal issue and asked for help. In fact, this project has created a part-time staff member who operates a helpline. This suggests that libraries could have a role in promoting the use of these new electronic products.

MS. CRETH: There are those of us who are extremely interested. We have already been approached by a political science faculty member, who has asked that we become the publisher for a political science journal. He is working with his association, and we have all agreed to go forward and study this. It would be enormously helpful to be able to sit down with a group of people to talk about how to launch such an endeavor. We have a series of questions that we need to answer.

MS. NUTTER: Those are very good points. I should give you an idea about how this meeting came about. Originally it was NC State University and Virginia Tech because we each had a project, and the library was actively involved. We were going to get together and meet in Raleigh, and we invited ARL. Of course, our editors informed their colleagues, and we started being besieged with requests. This meeting was not supported: the participants all paid their own way. We allowed them to invite themselves. Our sense now is that we are ready to do this in a more systematic way that allows everyone who is interested to be a part of this.

Robert Shirrell, journals editor from the University of Chicago Press, attended as well. He told us that if the participants took over the meeting, then it had gone well. Well, it was clear that it was very difficult for us to keep to the agenda. They were so excited to be able to talk to each other and to describe their efforts that it really turned out to be a sharing experience. We feel that the next step is to look at some of these issues more systematically.

I have a considerable packet of background information on the existing project. We are in the process of creating at SUNY-Albany a communications list. It will not be a bulletin board that is open to everybody in the world, but it will be limited to people who are working on or are interested in projects such as this. We can certainly add you to it or whoever on your campus wants to communicate with other people working on these specific refereed electronic journals. I would encourage all of you who have the opportunity to work with a project on your campus to seize that opportunity.

BUSINESS MEETING

BUSINESS MEETING

MR. RUNKLE: We will move immediately to consideration of the 1991 dues proposal, for the fiscal year beginning January 1, 1991. At its July meeting, the ARL board unanimously agreed to recommend an increase in ARL membership dues to $10,000, an increase of $1,560 for each member. Two hundred and fifty dollars of this increase is earmarked to be added to reserve funds. Materials were distributed to you in early September describing the dues and budget proposal.

ARL is completing a process that was begun three years ago to make the Association more responsive to member needs and interests. The membership's review of the programs of ARL led to the preparation of a document that includes a new vision, a new mission, and new objectives for ARL, establishing new capabilities that members have voted for. This document was distributed with the dues proposal.

As you know, the ARL Task Force on Financial Strategies recommended that the Association build its operating reserve over a number of years through a planned special surcharge. The program to build the operating reserve was begun this year. Two hundred and fifty dollars of each library's dues, for a total of approximately $30,000, has been deposited in a separate reserve fund. If the dues increase is approved today, the amount contributed to the special reserve fund in 1991, and in subsequent years, will be $500 for each library, for a total of approximately $60,000 a year. The total at the end of 1991 will therefore be $90,000, plus interest.

We have had a balanced budget in the last two years and are anticipating a balanced budget this year. We will end this year with a fund balance of approximately $[illegible]0,000.

The proposed budget for 1991 anticipates a fund balance in the same range. This fund balance is separate from and in addition to the special reserve fund. The proposal spells out three priorities to be addressed. The first is to maintain the present programs but also to strengthen the office support to accommodate the increased level of activity. We need adequate operational support for the relatively small cadre of professional staff in the ARL office.

Second, the support of the research and development function. During 1990, this activity developed and managed several grants, including the National Register of Microfilm Masters, the Retrospective Conversion Project, the NEH-supported Preservation Planning Program, the Mellon-supported Statistics DataBase Project, and the new Cultural Diversity Program. The board is convinced of the need for committing resources to grant development and project management.

The third priority is continuing to build the reserve. The plan calls for setting aside $500 per library per year until the reserve reaches approximately fifty percent of the total operating budget. Fifty percent of the present operating budget is approximately eight hundred thousand dollars. Depending on interest income, we should reach this around the year 2000. It could be that in three or four years, we will want to change the goal and/or the schedule for reaching it, but in the meantime, we are a long way from having a fiscally responsible reserve fund. The reserve fund we are building is not intended as a supplement to the budget, and it must be protected until it reaches an acceptable level. Once it reaches an acceptable level, the reserve fund can be used to ensure operating continuity, to provide emergency resources, and as a source of revenue through the use of interest on the capital.

I have received comments and questions from some of you regarding the dues proposal. I have already addressed some of the questions in these comments, and I am going to call on Duane to respond to other questions that I have received. I would like to read these questions first before calling on Duane. (1) Will ARL staff be increased? (2) Will the 1990 budget be balanced? I have already projected a balanced budget, but I will ask Duane to elaborate on that. (3) Will the 1991 projections of OMS training revenue stand up in the face of budget pressure in member libraries? (4) How realistic are the projections for research and development funds in 1991?

MR. WEBSTER: The first question concerns increased staff. We have not filled all positions this year, thus we have two openings already. In order to balance the budget this year, we have left unfilled the communications specialist position and a training program coordinator position in the OMS. While the new budget does not call for additional staff lines, we are looking to fill these two open positions that have been used for salary savings in order to balance the budget this year.

We have worked very hard at getting a good balanced budget state over the last three years. As you might recall, in the previous ten years, there were something like seven years in which there were deficits, and which caused us to eat into the reserve. In the last two years, we have been able to get to a balanced state. We do foresee a balanced state this year, based on the third quarter financial report that we received last week. In order to achieve that goal, we are taking extraordinary measures, including not filling positions, suspending non-reimbursed travel, implementing a reorganization, and increasing efforts to promote our publications and to create more publications for sale outside of the association.

We have worked both to build revenue from cost recovery activities and to attract new grants. We have also worked very hard to control costs, while trying to maintain services and be able to deliver on-time statistical and salary surveys, to maintain the things that you expect but with a great sensitivity to the cost.

The question on the projections for next year is very tough. The projections for our training and publications revenue in OMS seem very solid. We have had many training program requests and consulting requests this year that we have been unable to meet because of the fullness of our schedule. Furthermore, we are moving many of those into next year. Susan advises me that we are already very full with bookings.

Our publication program in the OMS has been strengthened in this last year. We see that also expanding. We are confident that the business is there and that the staff is in place, particularly as we replace the training program coordinator spot, which will give us an added person in order to run and meet the demand for bookings already in place.

In terms of the R&D projected revenue, we are also very confident. We are projecting at least $814,000 of grant revenue. That seems like an extraordinary number until you look at the activity report. You will see that we already have in place the NRMM grant, which is supported by an NEH and Mellon grant combination. Out of the $814,000, $733,000 is provided already and is in hand for doing work, most of which will be done, of course, through our contractor.

An additional $30,000 is in hand to do the Cultural Diversity Project, supported by H. W. Wilson. That leaves the remaining $50,000 to be supported through the increase in the dues being projected as a part of the proposal. It is also reasonable to expect, since we have made a major investment in developing grant proposals, that we have about a half dozen grant proposals in process and that we will be able to attract additional revenue. Of course, that additional revenue will incur expenses, and we believe that will balance out.

MR. RUNKLE: I want to emphasize that the board and the staff are committed to maintaining balanced budgets and protecting reserve funds. This has been accomplished for three years, sometimes with very aggressive measures to reduce expenditures, as Duane has pointed out.

A major responsibility of this and future boards and of the executive director and the ARL staff is to monitor income and expenditures and to be certain that corrective action is taken, when necessary, to keep the budget balanced. Future increases in dues are expected to reflect cost of living adjustments only. Increases for expansion of programs will occur only when members mandate it.

I ask your support of the board's proposal and of its judgment that this enterprise provides value for the money invested. As we face the decade ahead, we need a strong association representing our interests. I would like to have a motion on the floor before we begin discussion. Do I have a motion that the dues level for 1991 be set at $10,000?

MR. HENDRICKSON: I so move.

MR. RUNKLE: Kent Hendrickson has moved. Is there a second?

A PARTICIPANT: Second.

MR. RUNKLE: Is there discussion or questions?

[NO RESPONSE]

MR. RUNKLE: Is there a call for the question?

A PARTICIPANT: I call the question.

MR. RUNKLE: All those in favor, say "aye."

[CHORUS OF AYES]

MR. RUNKLE: All those opposed, "no."

[NO RESPONSE]

MR. RUNKLE: Dues are set at $10,000 for 1991. Thank you.

The next action item is the election of the three new board members. As you know, our board members serve for three years, and each year three new members are elected. The Nominating Committee this year was Sterling Albrecht, Nancy Cline, and Marilyn Sharrow. The Nominating Committee submitted its report, and the report was sent to you in September.

The nominations for the three open positions on the board of directors are Jerry Campbell, Duke University; Joan Chambers, Colorado State University; and Emily Mobley, Purdue University. Are there additional nominations from the floor? I might remind you that if you are going to nominate someone, you should ask the person before you do so. If there are no additional nominations, may I have a motion to accept the slate as presented?

[MOVED AND SECONDED]

MR. RUNKLE: All those in favor say "aye."

[CHORUS OF AYES]

MR. RUNKLE: All those opposed, say "no."

[NO RESPONSE]

MR. RUNKLE: Congratulations to the three of you. I would also like to congratulate Arthur Curley, who at the Tuesday board meeting was elected vice president and president-elect of the association. Arthur is librarian of the Boston Public Library.

STATISTICS COMMITTEE REPORT

MR. SHAUGHNESSY: It was interesting to hear Clifford Lynch's comments. He asked us to think about the first library that will have no books or journals, but will be totally electronic. How would we handle that statistically in the rankings? Well, your Statistics Committee has been hard at work on this very question.

Some of you will be pleased to know, for example, that the government documents question will be moving now, after two or three years, from being on the supplemental statistics form to the regular statistics form. We will have a draft question on documents for you to review at the May meeting. So, government documents, at long last, will be counted as part of the regular statistics. The plans are to attack and focus on other non-book and journal materials, as well. But those are a little bit down the pike. We are working on archives, maps, manuscripts, and those kinds of materials, as well.

Second, we have developed, thanks to the good work of Beth Shapiro, nine or ten access measures, which will be included on the supplemental statistics for next year. In other words, these will be tested to see whether you believe they address this access question. Once again, you will have an opportunity to see those measures and review them and comment on them at the May meeting.

Third, we are looking at a multi-year inventory. This item will not be asked of you every year but perhaps every three, four, or five years. As an inventory of factors related to access, we include such things as how many OPAC terminals does your library have? How many fax machines does your library have? How many microfilm readers and reader printers does your library have? How many seats does your library have? These kinds of questions.

We also are looking at remote access, but it may be too difficult in this first round to get a handle on remote access capability, other than ports leading into your mainframe or to the computer on which your online system is based. This inventory is also designed to get at the access question.

Finally, I want to report that several members, Kent Hendrickson, Kendon Stubbs, and Gordon Fretwell, and Sarah Pritchard from the ARL staff, have attended a meeting in Chicago recently to work with ALA and NCES on revising and reforming the IPEDS questionnaire. The staff is also working with NISO on their definitions in statistics, and ARL has been invited to work with IFLA to address international statistics questions.

All of these are very positive developments in the sense that instead of having to deal with three, four, or five forms, there is going to be much more unanimity in the kinds of questions that are asked and the definitions relating to those questions.

I want to thank everyone for getting your statistics in on time. You have taken my chiding very well, and no one has threatened me yet.

REPORT FROM THE EXECUTIVE DIRECTOR

MR. WEBSTER: It has been an extraordinary year. Part of what has been extraordinary is the culmination of the three-year planning process. This has been a major investment of your time and the staff's time, in looking at what the association is all about, what kind of association you want, what directions we should be taking, how strong and how active we should be, and what we should focus on.

Out of that process, you have seen the document, *Strategies for the 1990s* that presents a new vision, a new mission, a revised and updated statement of objectives that includes a specific statement directed toward technology and, very importantly, a new framework of capabilities that allows us to channel both staff effort and committee and task force efforts toward the purposes that have been established in this plan. As a concrete manifestation or implementation of this plan, we established three new capabilities in this last year: the Office of Scientific and Academic Publishing, the Coalition for Networked Information, and the Office of Research and Development.

I would like to comment very briefly on each of these new capabilities at the risk of underplaying the amount of effort that we have put into maintaining business as usual. I think it is important to look at these new capabilities because they really signal fresh strategies on the part of the association to, in fact, influence the larger environment in which research libraries have to perform and, looking toward the future, attempting to influence critical forces in that environment.

A little more than two years ago, ARL membership commissioned a study of serials prices. There were some who said that ARL was coming to this issue too late and with not enough in the way of resources. Two years later, the issue is even more urgent, but now the ARL study has established an agenda that has attracted the attention of both the commercial publishers and the scholarly communities. Most important, ARL now has an office, which is performing as the "point person" in a broadly based effort to address the skyrocketing cost of scholarly information. We were successful in recruiting Ann Okerson to direct the office. With her leadership, we are now marshaling pressure on publishers, are actively involved with acquainting the scholarly community with the causal factors related to this information crisis, and are beginning to identify and influence the forces affecting the future production, dissemination, and use of scholarly information.

It is this office that paid close attention to your discussions during the first part of this afternoon and the interest in working with the scholarly community in a more aggressive and active fashion. It is this office that is the agency through which we are establishing new links with the American Council on Learned Societies, specifically with NASULGC and AAAS, to form a national task force to address the question of the skyrocketing cost of information. In particular, we are looking for this new enterprise made up of institution-based organizations to give us a broader forum in which we can talk about the pressures at work on research libraries.

This is a new enterprise. We are in the process of negotiating exactly what it is going to look like. In fact, you may be able to talk to Peter Wagner, who represents NASULGC and has spent a fair amount of time working with Ann and myself in charting what this new collective alliance might do and who might operate in it.

We are also initiating a number of actions that we can take in concert with ACLS. Stan Katz, who is the president of ACLS, met with the ARL board of directors this summer to present his interests and ideas, and OSAP is now working directly with Stan's staff, Dr. Greenberg, to articulate several projects. One of the projects that is a very high priority is a jointly-sponsored electronic newsletter directed at humanist scholars to acquaint them with current developments in scholarly communications as well as to get them hooked into and using electronic services.

We are pleased with the extraordinary success the Office of Scientific and Academic Publishing has had in highlighting a set of issues in a very short period of time. We want to now go from highlighting those issues to orchestrating concerted action by provosts, academic administrators, and scholars to do something about the causal factors contributing to the information crisis.

The second new capability is the Coalition for Networked Information (CNI). You have heard a fair amount about this. I urge you to look at the activity report as a description of the activities underway in each of our new and ongoing enterprises. As you know, the coalition is a joint effort wherein ARL is working with EDUCOM and CAUSE. The purpose of the coalition is to promote the provision of information resources and services on existing telecommunications networks, as well as on proposed interconnected networks. The linkage of research libraries to these networks and therefore to each other and their respective constituencies is the immediate interest of ARL in establishing this capability.

I have to marvel at the phenomenal progress that we have made with this capability. You may recall that a year ago at this time, the idea did not exist. The ARL Task Force on Telecommunications, chaired by Nancy Cline, was given the charge by the ARL Board of Directors to look at what ARL might do to be more influential in the arena of telecommunications. This group was looking at the topic and, through their individual involvement in EDUCOM, were able to use that as a forum for brainstorming some ideas for their colleagues in EDUCOM and CAUSE.

The idea surfaced, I believe, at a CAUSE meeting in November of '89, it came to ARL, and the ARL Board looked at it in February, along with the three boards of the other organizations. The boards said, "Yes, this is a concept that has some possibility." I recall our question here of whether we could move fast enough, whether the risks that were inherent in this enterprise were worth the potential benefits. The board encouraged us to go ahead, and we did. And we went ahead in an interesting posture. While we wanted to go into the Coalition with these other agencies to address this set of questions, we were very much concerned that the librarians be able to express a strong presence in that coalition, to take a large and significant role.

Our posture was that we'd like to operate within the coalition, but we want to house it, administer it, and staff it. In the resulting negotiations, the other two organizations agreed. This is, in fact, legally defined as an ARL activity that accepts guidance and direction from the three organizations and a steering committee made up of those three organizations. Strategically, we thought it was very important that librarians play the leading role in the establishment and success of this enterprise. Some of you recall the early survey to you, asking if you would participate. We felt from our knowledge of the membership that we could marshal forty institutions that would be charter members of this enterprise.

Here we are, less than a year later, and we have 114 institutions that are sponsors in the task force. Two-thirds of those institutions participating in the CNI task force are ARL members. Phenomenal. In a very short period of time, we have attracted who I feel is the best person in the field to run the coalition. Paul Peters joined us in March. He spearheaded an extraordinary organizational effort to put together the financial structure, the legal structure, the programmatic structure, and the membership. He has single-handedly been able to gain the confidence and been able to achieve a close working relationship with EDUCOM and CAUSE.

Very importantly, ARL directors and staff are now working on legislation, on a network issue, on project definitions, in a way that just has not been possible in the past. As recently as the EDUCOM meeting last week in Atlanta, fifteen of the ARL directors were there. The Coalition was highlighted in one of the best attended programs at the meeting, and Paul was on another program panel. Both Paul and I met with the EDUCOM board, and it was the first time ever that an ARL executive director and staff member met with the EDUCOM board.

We now have two librarians on the EDUCOM board, Henriette Avram and David Bishop. One of the real success stories is that EDUCOM has adopted a new mission statement that looks amazingly close to ARL's mission statement. I think we have had a fair opportunity to influence them not only in information technology, but also to think in terms of what that technology is doing, that it is the information resources and services that will be carried on those networks.

So we are, it seems, having success with this strategy of working at a much different level with organizations like EDUCOM and CAUSE to influence the future of networking and, in particular, the information services and resources that will be available through the telecommunications network.

We are at the beginning of that project. It has a three-year business plan. At the end of that three-year business plan, there will be a very careful review and evaluation of the effort to determine what is needed at that point: maybe a new structure. I hope that if you have some questions about the coalition, you will raise them and allow either Paul or myself to respond to them.

The third new capability, the Office of Research and Development, consolidates the administration of grants and grant-supported projects operated by ARL. The goal of this capability is to build the ARL research agenda, as well as to attract support for it. The activity report lists the range of projects currently underway. Jeff Gardner has agreed to lead this effort and has proved to be the spark needed to energize the ARL research investment. I think his most recent example of doing that is that H. W. Wilson grant to support the Cultural Diversity Project.

The communication capability and the new name, format, and editorial policy for the ARL newsletter are also new developments this year. I hope you noticed the newsletter, and I hope you are pleased with it. We have been putting a lot of effort into it, changing it, and directing it more toward issues, as well as activities that are taking place within the association. Brigid Welch, the program officer for information services in OMS is the editor of the newsletter and is doing a marvelous job with it. In this new format we are attempting to channel the work and energies of the staff, in terms of the issues they are working on, into the newsletter as a way of highlighting the continuing evolution of the ARL agenda.

I would like to comment on some of the issues that we are looking at, given the strategic plan that you developed and the capabilities that we now have in place. First, of course, is the overwhelming pressure of stable and declining research library budgets. Do you know over forty states are experiencing fiscal crises of one sort or another? This affects the funding of higher education and, of course, the funding of research libraries. Horror stories on budget reductions and extraordinary decisions abound. This budget pressure comes at a time when the costs of scholarly information seem to be entering a new cycle of growth and when the proliferation of a new format of scholarly exchange forces added investment. We hope to look at aspects of this topic over the next year, and there is some part of the spring meeting that will be devoted to concerns in this general area.

A broad-based response to the budgetary pressures relates to the issue of the availability of access to global knowledge. This is the traditional concern of foreign acquisitions with which ARL has been long been associated. The current concern relates to the increase in knowledge available from the Pacific Rim, Latin America, and Western Europe. Member library ability to gain access to foreign language and foreign import materials is increasingly constrained, and fresh strategies for doing this must be found.

Another issue is that of cultural diversity in both the population served by ARL members, and in research libraries' staff. The H. W. Wilson Project allows us to attract funds to design a program that will be available for you to use in your institutions to develop a greater sensitivity to the needs exhibited by new employees and new users as they come and work in your facilities. At the same time, the board has established a new Task Force on Minority Recruitment chaired by Joe Boissé, which has been charged to describe for the board what actions are needed for research libraries to be more successful in attracting a more diverse labor population to our libraries.

We have been able to attract a person to operate the H. W. Wilson Cultural Diversity Project, to work with us in doing the data gathering, and to assist us in doing some of the design work there. I would like to introduce Kriza Jennings. We are delighted to have her working on this grant. We hope, as the grant progresses and it is successful in its design intention, that we will be able to attract additional support later to operate it in your libraries.

The final initiative, which you have already heard about from Tom Shaughnessy, is our concern with access measures for research libraries to use in helping our constituencies understand success of members in moving from the goal of ownership of recorded knowledge to one of securing access to information in a variety of formats. We are pleased that the Statistics Committee is moving to implement a new set of measures in that arena.

In closing, I want to thank you for your support of the association. Clearly, for us to have an active association that is able to be out in front, both organizationally and in terms of issues, we need to have your energies, your leadership, your interests, and your support. We have been getting that, and it has been absolutely crucial to our success.

It has been truly most fortunate that we have available for you a super staff. They have had, this year, a lot of pressure in starting new capabilities and maintaining continuing services in an understaffed setting. They have done an extraordinary job of not only doing that but doing it very well. I would like to salute them, I also want to salute your elected officers to the board, and the president, Marty Runkle. Marty has been a real pillar of strength over this year. Thank you very much for your support.

REMARKS BY THE ARL PRESIDENT

MR. RUNKLE: At the risk of mutual back-patting here, I do want to express appreciation for the leadership that Duane provides as Executive Director of ARL. I know from personal experience and observation over the last three years that he devotes an enormous amount of focused and creative energy on our behalf. He takes initiatives, while paying careful attention to what this association wants and not getting too far afield from that. We all owe him thanks for the job that he does for us. I am not going to give a report, per se. I want to recommend that you read the highlights of activities in the last six months, which the staff provides on a regular basis, and also *Strategy for the 1990s*. It is not a ponderous document; it is a thoughtful document, and I think it describes the essence of what we are about.

The association is very strong right now. We are making progress on many fronts and are in an excellent position to continue to influence developments in various arenas that effect our institutions. It has been a privilege and an honor to serve as president of the association. Working with the staff and the board has been extremely rewarding and satisfying, and I am looking forward to continuing to work with them as past president, which I am about to become. It is my privilege to pass the gavel to Marilyn Sharrow.

REMARKS BY ARL PRESIDENT ELECT

MS. SHARROW: Thank you, Marty. It has been a pleasure to serve with you on the board, and on behalf of the entire membership and the staff of ARL, I would like to thank you for your time and your steady and sincere commitment to the organization. It is traditional in many professional groups to honor outgoing presidents with a memento or a keepsake to remind them of their service on the board. ARL has not had such a tradition until now.

Marty, I would like to present to you this elegant paperweight that shows the ARL logo and is engraved with your name and the date of your presidency. I hope that it will grace your desk and that you will recall fond memories of your colleagues and the important role that the association plays in supporting the work of research libraries. There are four past presidents of ARL in the audience today, and I would like to present each with a paperweight engraved with his or her name and dates of office: Elaine Sloan, Jim Govan, Jay Lucker, and Richard DeGennaro. We will send a keepsake to those past presidents who are not present today.

It is my privilege today to begin my term as president of ARL. Although there is much work ahead of us, I hope that we will meet the challenge successfully. There is an Irish proverb to the effect that making the beginning is one-third of the work. With the assistance of the ARL board and staff and with all of your cooperation, that beginning is now well underway. We are fortunate to have a strong organization which has accomplished much in recent years and is working diligently on behalf of the member libraries.

It is my goal to continue the progressive stance ARL has assumed and act responsibly toward achieving the strategies of the '90s that we have set for ourselves. Higher education in general and research libraries in particular are facing economic and technological challenges of significant magnitude. I believe, through ARL, we will be able to cope creatively and positively with these challenges. I thank you in advance for your participation in this process.

Is there any further business? Hearing none, I declare the 117th Business Meeting of ARL concluded.

APPENDICES

APPENDIX A

REPORT ON ASSOCIATION ACTIVITIES

MAY 1990 - OCTOBER 1990

SUMMARY

A three-year, member directed review of the ARL Long-Range Plan culminated in "ARL: Strategy for the 1990s." This document presents a new vision, mission and strategic plan for the Association and signals a renewed energy and fresh determination to engage the challenges facing the leaders of research libraries as they prepare their institutions for an uncertain future. The implementation of this new plan has resulted in the establishment of three new capabilities: the Coalition for Networked Information, the Office of Scientific and Academic Publishing, and the Office of Research and Development. In the first three quarters of 1990, efforts were directed toward establishing the organization, staffing, and programs of these new capabilities while maintaining the established ARL capabilities and services.

Highlights of ARL program activities since the May membership meeting include:

- *Research Library Statistics , 1907/08 through 1987/88* machine-readable files published, p. 3
- Statistics Committee proceeds on collecting access measures, p. 3
- Expanded ARL newsletter distributed, p. 4
- ARL Membership meeting in New Orleans focused on higher education, p. 5
- ARL Strategy for the 1990s completed, p. 6
- New task groups on minority recruitment and library online systems, p. 6
- SPEC kits on travel policies and affirmative action, p. 7
- OMS launches collection evaluation institute, p. 8
- Conference Showcase booth at ALA spotlights cultural diversity, p. 9
- ARL expresses support for unrestricted reauthorization of NEH/NEA; submits joint statements to Congress on copyright and permanent paper issues, p. 10
- Briefing packet on NREN compiled, p. 11
- 1989 *Preservation Statistics* published, p. 12
- Office of Scientific and Academic Publishing arranges meeting on electronic journal publishing, p. 13

- 1991 dues proposal, p. 15
- Kriza Jennings is new OMS trainer, p. 15
- H.W. Wilson awards grant for cultural diversity project, p.16
- New research planned on foreign information resources and serials price indexes, p. 16
- Work begun on contract for National Register of Microform Masters (NRMM) Recon Project, p. 18
- Guidelines for Bibliographic Records for Preservation Microform Masters (Serials) approved, p. 18
- Report on mass deacidification systems published, p. 19
- Christine Crocker is Visiting Program Officer from Australia, p. 19
- Membership in the Coalition for Networked Information reaches 114, p. 19
- Task Force of the Coalition holds organizational meeting, p. 20
- CNI sets up program strategy, Working Groups, and fall Task Force meeting, p. 20

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ARL Capabilities

I. Statistics 3
II. Communications 4
III. ARL Membership Meetings 5
IV. Governance 5
V. Management Services (Office of Management Services) 7
VI. Federal Relations and Information Policy Development 10
VII. Technology and Access 11
VIII. Office of Scientific and Academic Publishing 13
IX. International Relations 14
X. General Administration 15
XI. Research and Development 16
XII. Coalition for Networked Information 19

I. Statistics Capability

The statistics capability is organized around collecting and distributing quantifiable information describing the characteristics of research libraries. This capability includes operation of the ARL Statistics Committee, and collaboration with other national and international library statistics programs.

ARL Statistics. The culmination of several years of work on the part of ARL staff, the ARL Statistics Committee, and the member libraries,*Research Library Statistics, 1907/08 through 1987/88,* was issued in July 1990. The consolidated computer file includes eighty years of data on collections, staff and expenditures for the 119 U.S. and Canadian libraries currently in ARL, and for four former members or predecessors of current members. The machine-readable version will allow a variety of analyses of trends in expenditures, acquisitions, and staffing, stratified by types of libraries, geographic regions and other characteristics. Each set of *Research Library Statistics* includes a documentation booklet and six diskettes. The Association received ongoing encouragement and grant support from the Andrew W. Mellon Foundation for a portion of the development costs. Kendon Stubbs of the University of Virginia Library supervised the preparation of the data and writing of the documentation with the collaboration of Robert E. Molyneux. Publication of the machine-readable versions of historical data for law and medical school libraries, and annual statistics for ARL and law/medical libraries, is expected later this year.

ARL has begun participation in a project coordinated by the ALA Office for Research, to improve the quality and timeliness of academic library statistics collected by the National Center for Education Statistics as part of the Integrated Postsecondary Education Data System (IPEDS). Kent Hendrickson and Kendon Stubbs of the ARL Statistics Committee, and Sarah Pritchard, ARL Senior Program Officer, are members of the project's advisory committee.

Salary Survey. Questionnaires and diskettes for the 1990 *Annual Salary Survey* were distributed in late July. Worksheets and instructions were revised to try to avoid some of the data transcription problems encountered last year. Several optional questions were added on a one-time basis, seeking information on degrees earned, year of birth, detailed job subcodes, and length of service in the reporting library. It is hoped that the additional questions, timed to be able to compare them with 1990 national census results, will allow more far-reaching analysis of our data.

Preservation Statistics. The 1988-89 *ARL Preservation Statistics* were published and sent to the membership in July. The document includes tables of data from 107 libraries in the United States and Canada, and an analysis of 40 libraries with established preservation programs. The aggregate data reveal that ARL libraries spend from 1.14% to as much as 10% of total operating budgets for preservation, and 1988-89 preservation expenditures exceeded $60 million, 23% more than 1987-88. The 1989-90 questionnaire was revised and distributed in September.

Future Directions. The Committee on ARL Statistics received two research reports from work supported by the Mellon Foundation, part of a multi-part grant summarized on page 17. These are a review by Beth Shapiro of possible access measures for incorporation in the ARL statistics, and an evaluation by Jean Loup of the data used to compile "library expenditures as a percentage of university education and general expenditures." The committee agreed to accept several recommendations from each report, and in particular, to begin asking for measures of reference and electronic access on the 1991 supplemental statistics questionnaire. The committee is still investigating the development of "compiled" software to speed general data collection and verification.

II. Communications Capability

The communications capability is designed to apprise ARL members of current developments of importance to research libraries, inform the library profession of ARL positions on issues of importance to research libraries, influence policy and decision-makers within higher education and other areas related to research and scholarship, and educate academic communities concerning research library issues. Within this capability is the coordination of ongoing efforts across all program areas to maintain and extend ARL's relationships with other organizations in the scholarly community.

Newsletter. The redesigned *ARL: A Bimonthly Newsletter of Research Libraries Issues and Actions* was launched in May with issue 150; number 151 and 152 appeared in July and September, respectively. The editorial scope of the newsletter has been broadened, and it now includes longer pieces of professional writing by ARL staff and external contributors. A special mailing was done to bring the newsletter (and other ARL publications) to the attention of the members of the Society for Scholarly Publishing.

Minutes of the Meeting. The *Minutes of the 114th Meeting* (May 1989) were published and distributed in June. The October 1989 minutes are in the final stages of production, and editing has begun for the May 1990 transcripts.

Relations with the press. ARL actions and reports on selected issues, including serials pricing, government information policies, preservation, and the National Research and Education Network, have been highlighted in national newspapers and library and higher education journals. Press coverage includes the *Chronicle of Higher Education, Raleigh News and Observer, American Libraries, Library Journal, LJ Hotline, NFAIS Newsletter, ACLS Newsletter, Advanced Technology Libraries, CAUSE/ EFFECT*, the newsletter of Computer Professionals for Social Responsibility, and *Security Letter*. The 1989-90 ARL statistics were the basis of a table in the June 27 issue of *CHE*. Members are requested to alert ARL staff to press reports in local papers.

Relations with the scholarly community. Extensive collaboration has occurred in connection with the establishment of the Office of Scientific and Academic Publishing, and the Coalition for Networked Information, as documented further under those headings. Other activities during this period included ongoing relationships with the National Humanities Alliance, the American Council of Learned Societies and the American Association of Universities; Stanley Katz, president of ACLS, met with the ARL Board of Directors in July to explore issues of mutual interest.

III. ARL Membership Meetings

The ARL membership meeting capability is designed to develop programs on topics of interest to ARL membership, schedule and manage meetings and activities, coordinate on-site local arrangements, and evaluate the success of these meetings. The May meeting emphasizes a topical program, coordinated by the ARL President-elect; the October meeting focuses on internal finances, elections and strategic planning.

May 1990. The 116th ARL Membership Meeting, hosted by Tulane University, was held in New Orleans, May 10-12, 1990. The program was entitled "Higher Education Reform in a Culturally Diverse Environment," with speakers from the higher education and research communities addressing changes in educational philosophy and the curriculum, and the impact of demographic and cultural trends on higher education. Town meeting discussions were held on serials prices, preservation and the Coalition for Networked Information. Small-group "current topics" briefings covered access to foreign information resources, international librarianship, minority recruitment in research libraries, and the future of online library information systems.

October 1990. The fall meeting is to be held in Washington, D.C., at the Georgetown University Conference Center. The theme of this meeting is the future of information services in research libraries in the context of advanced technology and changes in the production and dissemination of information. Dr. Robert Weber, a principal in Northeast Consulting Resources, Inc., will present several "endstates" that reflect different configurations of factors in publishing, scholarly communication, government regulation, technology, and the like. Directors will be asked to define the kinds of services that could exist in each case and the administrative and policy issues likely to emerge. An important goal of the session will be to identify roles and actions for ARL in this arena. On Friday morning, a town meeting will explore two topics: improving access to and services for scientific and technical literature, and current strategies for coping with rising serial prices.

May 1991. The next membership meeting will be held in conjunction with that of the Canadian Association of Research Libraries in Montréal, Québec. Planning is under way for a meeting to focus on finance/budget issues in research libraries.

IV. Governance

The capability for governance of the Association is intended to represent prudently the interests of ARL members in directing the business of the Association. The governing body is the ARL Board of Directors. The functions of the Board include: to establish operating policies, budgets, and fiscal controls; to approve long-range plans; to modify or clarify the ARL mission and continuing objectives; to monitor performance and the succession of the Executive Director; and to represent ARL to the community. The staff role in this capability is to provide information to the Board adequate to fulfill its responsibilities in a knowledgeable and expeditious manner. The Board establishes several committees to help achieve effective governance of the Association.

Membership Committee on Non-University Libraries. The Board approved the report of this committee at its May 1990 meeting, with minor adjustments to the procedures made at the July 1990 meeting. The official ARL membership criteria documents have been revised to incorporate the changes and were sent out to institutions with a current interest in membership.

The ARL Planning Process. A three year review of the ARL long-range plan was completed. This process included: the Task Force on Association Responsiveness, chaired by Ken Peterson, which recommended various changes in membership meeting format and characteristics; a Task Force on Review of the Five-Year Plan, chaired by Kaye Gapen, which resulted in a full membership discussion of changes needed in the multi-year plan; and a Task Force on Financial Strategies, chaired by David Bishop, which produced a set of financial principles for ARL. These planning efforts culminated in the preparation of a new vision, mission and strategic objectives for the next decade, which are presented in "ARL: Strategy for the 1990s." ARL staff compiled a document encompassing these new statements and capabilities; it was approved by the Board in July 1990 and distributed to members in September.

New Ad Hoc groups appointed. In response to member concerns and discussions at the May membership meeting, the Board of Directors formed two new groups at its July meeting:

- *Task Force on Minority Recruitment*: To develop proposals for ARL initiatives in the areas of recruitment, retention, and workplace integration of minorities in professional positions in research libraries. A preliminary report is due in February 1990. Chair: Joseph Boissé; Staff: Susan Jurow.

- *Working Group on Future Online Library Information Systems.* To develop a proposal to the ARL Board for a planning process that would result in the issuance of a "white paper" on the nature of future online library information systems. Chair: Paula Kaufman; Staff: Paul Peters.

Status reports on standing committee activities follow:

Committee on Government Policies:
Chair, Merrily Taylor; Staff, Prue Adler
1990 Agenda of issues: U.S. government information policies, reauthorization of HEA, and copyright issues.

Committee on the Management of Research Library Resources:
Chair, Sul Lee; Staff, Susan Jurow
1990 Agenda of issues: design of a strategy for future office services, review of training needs of research libraries, and consideration of library staffing initiatives.

Committee on ARL Statistics:
Chair, Tom Shaughnessy; Staff, Sarah Pritchard
1990 Agenda of issues: collecting and displaying comparable data on government documents collections, developing access measures, developing machine-readable formats and software for data collection.

Committee on Bibliographic Control:
Chair, Dorothy Gregor; Staff, Jutta Reed-Scott
1990 Agenda of issues: supporting and monitoring the efforts of the Library of Congress in the area of bibliographic control; completion of guidelines for bibliographic records for preservation microfilm masters (serials); monitoring the National Coordinated Cataloging Project; examination of the future agenda for the Committee.

Committee on Collection Development:
Chair, Susan Nutter; Staff, Jeffrey Gardner, Ann Okerson
1990 Agenda of issues; follow up on serials prices project, operation of the NCIP, ARL role in the issue of foreign acquisitions, and strategy for examination of the larger question of the future of scholarly communication.

Committee on Preservation of Research Library Materials:
Chair, Carole Moore; staff, Jutta Reed-Scott
1990 Agenda of issues: promoting use of permanent paper; advancing the development of a North American strategy for preservation; analysis of preservation statistics; formulating descriptive models for preservation program development; and continuing retrospective conversion of the National Register of Microform Masters (NRMM).

V. Management Services (Office of Management Services (OMS))

This capability encompasses the provision of consulting, training and publishing services on the management of human and material resources in libraries. These activities are carried out through the Office of Management Services, including the Academic Library Program, the Systems and Procedures Exchange Center, and the training and staff development program. The Committee on the Management of Research Library Resources oversees and advises on the work of OMS, assists in the development and evaluation of programs, and recommends OMS policy and priorities.

A. **ACADEMIC LIBRARY PROGRAM :** Activities related to conducting institutional studies and consultations at ARL member libraries. During this period, several projects were in various stages of operation:

Preservation Planning Program Studies: University of Florida, National Agricultural Library, Purdue and the Washington Library Consortium (see also p. 17).

Public Services Studies: Howard University and the World Bank/IMF Joint Library.

Leadership Development and Strategic Planning Programs: University of Chicago, Harvard College Library, Oklahoma State University and Michigan State University.

Organizational Diagnosis: Virginia Polytechnic Institute, University of British Columbia, and Rice University.

Special Consultations: University of Minnesota and University of Saskatchewan.

B. **SYSTEMS AND PROCEDURES EXCHANGE CENTER (SPEC):** Gathers, analyzes and distributes information on contemporary management techniques, conducts surveys and analytical reviews, and answers inquiries on library issues and trends.

Quick-SPEC Surveys Completed. Three Quick-SPEC surveys were conducted on the following topics: (1) Serials Price Increase Impacts; (2) Recruitment/Retention of Minority Professional Staff; (3) Campus Information Policies.

Quick-SPEC Surveys Planned. One Quick-Spec survey is planned for November on the use of upward evaluation in library management.

SPEC Kits Completed. The following have been completed: *#161 Travel Policies in ARL Libraries; #162 AV Collections in ARL Libraries; #163 Affirmative Action Policies in ARL Libraries.*

Upcoming SPEC Kits. *Remote Storage Access Policies; Minority Recruitment Policies and Practices; Cultural Diversity Programs in ARL Libraries; CD-ROM in ARL Libraries; Expert Systems in ARL Libraries; ARL Library Materials Budgets; Collection Development Performance Evaluation.*

Upcoming SPEC Surveys. Circulation Policies in ARL Libraries; Branch Libraries; Technical Services Training Programs; Environmental Conditions for Library Collections; Scholarly Workstations in ARL Libraries; Managing Student Workers; Organization of Access Services in ARL Libraries.

Automation Inventory. The *1989 Automation Inventory of Research Libraries* will be published in November of 1990.

C. **TRAINING AND STAFF DEVELOPMENT PROGRAM:** A comprehensive program of organizational and individual training and consulting to help libraries find better ways of developing their human resources.

A new institute, the **Collection Evaluation Institute**, was added to the program. The institute is for subject bibliographers, collection development librarians with managerial or supervisory responsibilities, and collection management administrators. It focuses on assessing and improving collection effectiveness in academic and research libraries. The three-day workshop presents strategies for implementing collection evaluation programs in libraries and covers several approaches to assessing collections. The intent is to explore collection assessment within the context of broader collection management issues. The first institute was conducted September 24-26, 1990.

During this period, the following other training events were conducted:

Basic Management Skills Institutes
May 15-18, Seattle, WA
June 12-15, Cornell University
June 18-21, Washington University, St. Louis
Sept. 10-13, New York Public Library
Sept. 25-28, Philadelphia, PA

Advanced Management Skills Institute
July 29-August 3, University of Texas at Arlington

Training Skills Institute
July 31-August 3, Atlanta, GA
Sept. 10-14, National Library of Canada

Creativity to Innovation Workshops
May 30-June 1, University of California, Berkeley

Resource Management Institute
February 13-16, 1990, Washington, DC

Special Focus Workshops
May 21-22, San Jose State University, Coaching Skills Workshop
June 22, AALL, Creativity Workshop
Aug. 15-16, M.I.T., Presentation Skills Workshop
Aug. 28-29, Wayne State University, Creativity Workshop
Sept. 21, NY Ontario ACRL Chapter, Creativity Workshop

Scheduled programs remaining in 1990 include:

Advanced Management Skills Institute
November 4-10, 1990, Chicago, IL

Collection Evaluation Institute
November 14-16, Washington, DC

Video Loan Program. In 1989 OMS launched a video loan program in response to expressions of interest from personnel and staff development officers in ARL libraries. The program's goal is to make management videos available to libraries inexpensively. Currently, there are 26 different videos in the library and second copies of four titles. The program has 28 subscribers. Most libraries screen the videos during brown-bag lunch seminars. OMS staff produce a quarterly newsletter distributed to subscribers free of charge, with reviews of available videos and listings of new acquisitions. The program operates on a cost-recovery basis, with income used to purchase new videos or additional copies of popular titles.

ARL/OMS ALA Conference Showcase Booth. The theme of this year's exhibit at the ALA Annual Conference was "Encouraging Cultural Diversity in Academic and Research Libraries." Three multi-media exhibits were presented:

- The Libraries of the University of California's university-wide Library Residency Program. The program assists members of underrepresented groups gain entry into academic librarianship. The display presented several campus programs, such as the internship programs at the Santa Barbara and Los Angeles campuses.
- The University of Michigan Library's Diversity Program. Several aspects of this comprehensive program were highlighted in the display including the Diversity Task Force, the Diversity Librarian position, Peer Information Counseling, the Recruitment and Retention Program, Training-Intern Program, and special programs including workshops on racism. The focal point of the display was the library-produced video, *The Diversity Program at the University of Michigan Library*.
- Stanford University Libraries developed a multi-faceted program to encourage cultural diversity within the Libraries, the library profession, the academic program, and the student population. Components spotlighted in its display included Cultural Outreach Librarian, Minority Library Interns, Affirmative Action, Collection Development, and Exhibits.

VI. Federal Relations and Information Policy Development

The federal relations and information policy capability is designed to: monitor legislative and governmental activities on matters of concern to research libraries in the U.S. and Canada; prepare analysis of and responses to national information policies; influence federal action on proposals related to research libraries; orchestrate examination of issues touching on the future development of research libraries; and develop ARL positions on federal and information policy issues that reflect the needs and interests of members. This capability includes the ARL Committee on Government Relations.

> **Support for:** the free expression of ideas; reauthorization of the NEA/NEH/IMS without substantive changes in the agencies' mandate; provisions in the Paperwork Reduction Act (PRA) to contain OMB's authority vis-à-vis information dissemination activities of federal agencies and also to bring support for the role of the private sector into balance; legislation to establish the National Research and Education Network; legislation to eliminate the distinction between published and unpublished materials with regard to fair use; legislative changes that would strengthen and update GPO's role in the electronic dissemination of government information; a national policy on permanent paper; reconciliation of two important but potentially conflicting goals, that is, government use of permanent paper for publications of enduring value and increased congressional and agency use of recycled paper; and the electronic dissemination of the *Congressional Record* and Supreme Court decisions.
>
> **Opposition to:** any diminution of the authority of the legislative branch for government information dissemination; an operational role for OMB in information resources management; proposals or legislation to effect licensing or copyright-like restrictions and significant additional costs associated with use of government information; availability of government information only through private sources.

Tactics employed included testimony before congressional committees, written responses to committee questions, visits to congressional staff, memoranda and information updates to ARL members, and ARL staff letters and calls. ARL activity in conjunction with other organizations has been extensive during this period.

Defining OMB's and GPO's Roles in Government Information Dissemination. ARL has been a key participant in congressional reauthorization of the Paperwork Reduction Act, and a review of other chapters of Title 44 concerning statutory authority for IRM activities, GPO, and the Depository Library Program. ARL staff continue to work with congressional staff on PRA legislation to improve provisions relating to information dissemination and related legislation to update GPO's statutory authority. Staff have also participated in reviews of OMB's Federal Information Policy Locator (FILS) system.

NREN legislation. ARL has been an active participant in promoting legislation calling for the establishment of a National Research and Education. Activities include visits to congressional staff, distribution of a briefing packet to the membership on this topic, and correspondence to members of Congress and staff.

Testimony. ARL with ALA submitted written testimony in support of H.R. 4263 and S. 2370. These bills seek to remedy problems stemming from recent federal court rulings that restrict the quoting of excerpts from unpublished primary sources or requiring permission for such use. A statement was also submitted by both organizations on the Congressional Recycling Act of 1990 concerning recycling and permanent paper issues.

Related activities:. Consultation with congressional staff on passage of the permanent paper resolution in the House of Representatives; discussions and correspondence with the Department of Education and other higher education groups concerning the upcoming HEA reauthorization; tracking of agency appropriations and discussions with appropriate congressional staff; participation in Congressional panels concerned with scientific and technical information (STI) and copyright issues; and discussions concerning archiving issues relating to STI.

VII. Technology and Access

This capability addresses the myriad issues related to the ARL continuing objective of enhancing access to scholarly information resources. The work of four ARL groups is covered by this capability: Telecommunications; Collection Development; Preservation; and Bibliographic Control. The groups examine the opportunities and directions available to research libraries as communication and research patterns evolve within the higher education community. It is important for ARL to understand and help influence this changing pattern of scholarly communication and assist in the framing of the emerging information infrastructure.

Activities included in this capability also represent other program categories, particularly the Office of Scientific and Academic Publishing, the Coalition for Networked Information, and the Office of Research and Development.

Task Force on Telecommunications.

The ARL Task Force on Telecommunications met during the May membership meeting and briefed the ARL Board of Directors on Task Force activities. Chair Nancy Cline also met with ARL staff in September on Task Force business. A briefing package on the National Research and Education Network was compiled and sent to the ARL membership in July. At the request of the ARL Board of Directors, the Task Force will be formulating a draft campus information policy statement. In addition, the Task Force has been asked to provide guidance to the ARL Board concerning how best to represent ARL interests and positions within the Coalition for Networked Information and to influence CNI's agenda to incorporate or reflect ARL interests.

Related activities: As an outgrowth of the May Membership Meeting, a recommendation was made to the Board to develop a "white paper" to respond to issues identified by the Ad Hoc Committee on Research Library needs for Automated Information Systems. At its July meeting, the Board approved the formation of a Working Group on Future Online Library Information Systems, with a charge to design a proposal for a planning process that would result in such a white paper. Paula Kaufman will chair the working group, which will meet for the first time in October 1990.

Committee on Collection Development.

The Committee is working with ARL's Office of Research and Development (ORD) in the design of a study of national needs in the area of access to foreign materials as well as possible strategic responses to those needs. A draft proposal was discussed in May with a revised document scheduled for the agenda at the October meeting. The Committee is also considering needed action in the general area of North American scientific and technical information delivery needs. In addition, the Committee will be working with the ORD in evaluating possible projects to assist or enable faculty to create and disseminate electronic publications, and the general area of cooperative collection development projects. The Committee will continue to advise ARL staff on the operation of the North American Collections Inventory Project (NCIP).

In its advisory capacity to the Office of Scientific and Academic Publishing (OSAP), the Committee is working to develop a project aimed at building and maintaining a discipline-based serials prices database. A strategic plan for the OSAP will be presented at the October meeting.

Committee on Preservation of Research Library Materials.

The Committee is pursuing a number of initiatives during 1990 to address preservation problems in research libraries. One central effort has been the development of descriptive models of preservation programs, a project supported by a grant form the H.W. Wilson Foundation (see p.18). Another major focus has been monitoring developments in mass deacidification. A report by Visiting Program Officer Karen Turko, University of Toronto, on planning and managerial issues in selecting mass deacidification systems was published and distributed to members in September. Building on the momentum of the campaign to promote the use of alkaline paper, ARL in collaboration with the American Library Association, the Commission of Preservation and Access, and the National Humanities Alliance published a revision of the 1988 ARL Briefing Package number 3, entitled *Preserving Knowledge: The Case for Alkaline Paper*. The publication was sent to members in September.

The Committee continues to monitor the preservation statistics program. The report on the 1988-89 Preservation Statistics was published in July. Based on feedback from members, the 1989-1990 survey has been revised and was mailed out to members in September. The Committee facilitated a discussion of recent issues in preservation through a "town meeting" at the May 1990 membership meeting.

Committee on Bibliographic Control.

One central activity has been the preparation of the "Guidelines for Bibliographic Records for Preservation Microforms Masters (Serials)" that were developed by Visiting Program Officer Crystal Graham, University of California, San Diego (see p. 18). The Committee approved them in May and the ARL Board adopted them as an ARL policy statement at its July meeting. The serials guidelines have been combined with the previously prepared monograph guidelines. The final compilation of the guidelines for record creation for preservation microform masters has been distributed to members.

A second committee effort focused on national strategies for cataloging the LC arrearages. At a special meeting on June 23, 1990, the Committee discussed the LC arrearages reduction management plan. The Committee's report was accepted by the ARL Board of Directors as a formal ARL response and forwarded to LC. In May, the Committee began to examine its future agenda, and plans to explore a wide range of issues at the October meeting that will shape the 1991 agenda.

VIII. Office of Scientific and Academic Publishing

The Office of Scientific and Academic Publishing (OSAP) is designed to identify and influence the forces affecting the production, dissemination, and use of scholarly and scientific information. The activities of the new office will build on the results of the ARL serials prices project and on work ongoing in the profession. Recently, the director of OSAP has prepared a statement of goals and objectives, to be reviewed by the Collection Development Committee and to result in a brochure for distribution as appropriate.

Influencing the scholarly and academic community. The Office has sought opportunities to meet with association officers and to participate in forums sponsored by various education, publishing, and scholarly associations. Some of these include

- AAU (Association of American Universities), which has asked for topics for their Library Task Force;
- NASULGC, whose Library Committee Chair (Dr. Peter Wagner, Provost at SUNY Binghamton) has allocated a day at ARL offices to discuss agenda items of mutual interest and has committed to pursuing library issues at their November conference;
- ACLS, where discussions take place regularly regarding proposed joint projects (grant proposals and a -- possibly electronic -- newsletter on scholarly communications);
- SSP, including a paper at the June conference session on Intellectual Property Ownership;
- STM, whose new Library Relations Committee meets quarterly and whose aim is to seek forums for publishers and librarians to exchange viewpoints, problems, and processes.
- Materials Research Society, for which a brief article on serials pricing has been written, with requests for further such pieces.
- American Mathematical Society, whose January 1991 annual meeting will include a research library session organized by OSAP.

With North Carolina State University Library as a host, OSAP assisted in arranging a conference on October 8, 1990, for creators of eight electronic journal (as opposed to bulletin board or newsletter) projects. These have originated in assorted academic institutions, in various subject areas. They share newness, excitement about the possibilities of networking technologies, and idealism about sharing ideas quickly and effectively. Enthusiasm was high for sharing experiences and working through problems different from those in editing and producing journals in paper form.

Working with the library community to communicate events in the scholarly publishing arena. After the success of the Plains librarians/Provosts meeting in April, a number of ARL libraries have begun planning meetings based on that model, whether with chief academic officers in the region or individual institution, with faculty, or as some combination. OSAP has assisted with the next such forum, planned for December 5th in North Carolina, with library directors, CAOs, library liaisons, and selected guests. Subsequent meetings and invitations include:

- University of Tennessee and Iowa State (both winter 1991);
- University of Iowa Library, Scholarly Communications Conference, October 1991.
- University of British Columbia Libraries and the Library School invited OSAP to make various presentations in early October to staff and students. During that same visit, the University of Victoria (non-ARL) also arranged a presentation to faculty.

Other library activities have included:

- Invitation to meet with RLG Collections Development Committee about their Long-Term Serials Project, with a view to how the two organizations might co-operate in this.
- Presentation on "Scholarly Publishing in the NREN" to the Coalition for Networked Information, June 6th, 1990. At least 50 reprints of the talk have been mailed out on request.

- As chair of the ALA/ACRL Discussion Group on Journal Costs in Academic Libraries, OSAP director Ann Okerson presented a panel of legal and political experts at the June meeting, on "Legal Issues in Journal Publishing."
- Election of Ann Okerson as vice-president/president-elect of the North American Serials Interest Group (NASIG).
- Invitations to speak at November AMIGOS session on Electronic Publishing and to the Canadian Library Association in 1991.

Research and investigative activities.

- Quick-SPEC survey on book and serial cuts projected for 1991, and other responses to the announced steep price increases for scholarly journals. The results will be reported to membership at the October meeting.
- Co-sponsorship of a study with University of Florida staff on use of electronic journals and like materials in ARL libraries. Mailing will be in September, with completion scheduled for the end of the year.
- Working with ARL Office of Research & Development on a proposal to create a descriptive data base of serials prices and page counts.
- Follow-up and dissemination of information on Gordon & Breach litigation.

IX. International Relations

This capability covers monitoring activities, maintaining selected contacts, identifying developments on issues of importance to American research libraries, and sharing experience of North American research libraries that may contribute to the development of collections and services in research libraries internationally.

A briefing to explore the participation of ARL and ARL directors in IFLA was held as part of the May 1990 membership meeting. The OMS is currently hosting a visiting program officer from the Australian Information Management Association, Christine Crocker, who has a Fulbright fellowship to support her work through October, 1990. Duane Webster, Executive Director, attended the IFLA meeting in Stockholm along with several ARL directors. He represented the Association on the Executive Committee of the Roundtable for the Management of Library Associations and participated in various sessions concerning research library interests in the international arena.

The ARL Executive Director presented two papers at a conference on Scholarly Communication and Serials Prices held in Chester, England in June, sponsored jointly by the Standing Conference of National and University Libraries (SCONUL) and the British Library, Research and Development Department. This participation allowed further discussion of establishing joint projects among American and British research libraries.

X. General Administration

General administration encompasses overall coordination and management of the Association, program planning and strategy development, staffing, financial planning and strategy, fiscal control, and secretarial support and office operations.

Financial Management. An important focus of administrative efforts in the first three quarters of 1990 has been establishing the financial and organizational structures for three new capabilities formed in 1990: the Office of Scientific and Academic Publishing (OSAP), the Office of Research and Development (ORD), and the Coalition for Networked Information (CNI). OSAP was established as a result of the Serials Prices Study Project and is administered as an Executive Office cost center. ORD was established by consolidating separately funded projects formerly maintained by the Executive Office and the OMS. ORD is administered with separate financial statements since projects are dependent on the availability of grant funds.

CNI was established to function as an ARL activity that accepts direction from CAUSE and EDUCOM. The host agreement between ARL, CAUSE, and EDUCOM provides for CNI to be directed by ARL's Senior Program Officer for Technology, and for 85% of that program officer's salary and benefits, all of CNI's direct costs, and all of CNI's support costs to be recovered from Coalition membership fees and financial contributions. The remaining 15% of the salary and benefits of ARL's Senior Program Officer for Technology and all of CNI's indirect costs are included in the General Funds Combined budget.

In July, a 1991 financial strategy was developed with the advice of the ARL Executive Committee which calls for resources to maintain current levels of staff and ongoing capabilities while continuing to build the operating reserve. Subsequently, the ARL Board of Directors approved a dues proposal for membership consideration that establishes a dues figure of $10,000 for 1991, an increase of $1,560. This recommendation is the culmination of a planned three-year staged increase in annual dues that allows the Association to maintain the activities approved by the membership.

Staff changes. As opposed to the prior six months, there have been no further structural changes at ARL since May 1990. The new offices and redefined positions have become fully operational and well-integrated.

Office of Management Services: **Kriza Jennings** has joined OMS as a trainer, effective August 20. In addition to duties in the Training and Staff Development Program, she will be responsible for design and development of OMS institutes on managing cultural diversity in the workplace. Jennings' previous professional experience includes positions at the United Theological Seminary Library in Dayton, Ohio, the National Afro-American Museum and Cultural Center, and Wright State University Fordham Health Science Library. She holds an MLS from Kent State University and a master's degree in educational media from Wright State.

Coalition for Networked Information: **Joan Lippincott** has been appointed Acting Assistant Director, a position she will occupy on a part-time basis through early December. Now working on her doctorate in higher education at the University of Maryland at College Park, she was previously Head of Public Services for the Albert R. Mann Library at Cornell University.

Federal Relations: **Prudence Adler's** position has been designated as Assistant Executive Director - Federal Relations and Information Policy, to reflect the increased prominence of this activity within ARL and in relations with external associations and agencies.

Cheryl Mazurek is the new ARL office assistant and receptionist; **Stacie Steinke** and **Annette Verna** are half-time publications assistants with the SPEC program.

Program Officer for Communications: This position remains unfilled; it is now planned to be filled at a professional level but most likely half-time, starting January 1, 1991.

Office communications. A new, fully digital Panasonic telephone system was installed in the ARL and OMS offices in July. The new system allows more efficient office operations as a result of direct inward station dialing, system-wide stored speed dialing, and other features that have improved call management. Two additional telephone lines and a microcomputer-based call accounting program were also installed. Equipment was procured for the first phase of a local area network to link the Macintosh workstations in the Executive Office, providing rudimentary file-sharing and networked access to printers and modems. In the second phase, to be implemented later, the network will be expanded to offer electronic mail and link the Executive Office equipment with DOS machines in the OMS. A new database of ARL institutions and directors was developed, including internal data for statistical tracking (for example, salary survey codes) and electronic mail numbers. Conversion of office systems from the former Wang equipment is almost complete.

XI. Research and Development

The ARL Office of Research and Development consolidates the administration of grants and grant-supported projects administered by ARL. The major goal within this capability is to energize the ARL research agenda through the identification and development of projects in support of the research library community's mission as well as the development of funding support for those projects. The ARL Visiting Program Officer project is a part of this capability.

H. W. Wilson Diversity Project. In late August, the H.W. Wilson Foundation awarded a grant of $30,000 to ARL for a project on "Meeting the Challenges of a Culturally Diverse Environment," intended to assist libraries in developing organizational and programmatic responses to major demographic shifts occurring in North America. The program design will include approaches to organizational self-assessment, in-house training programs, local diversity program development, and options for new user programs. The project is being operated through the Office of Management Services.

New initiatives under development. The Office of Research and Development is preparing proposals in at least two areas of substantive research:

- *Foreign publishing, research libraries, and scholarship in the 1990s.* A draft proposal has been prepared, reviewed with the ARL Collection Development Committee, and revised for further discussion in October. The intent of the project will be to develop a greater understanding of research library needs in the area of providing access to foreign materials, which can then lead to the formulation of strategic options for the research library community.
- *Discipline-based serials price indexes.* A draft proposal for a project aimed at constructing an annual serials price index geared to specific academic disciplines has been prepared for consideration by the Collection Development Committee this fall. As initially envisioned, the project would be operated by the Office of Scientific and Academic Publishing and would involve several ARL member libraries in data gathering.

Andrew W. Mellon Foundation Statistics Project. A multi-part program funded with $65,000 from the Andrew W. Mellon Foundation neared completion this year, enhancing the form and content of the ARL statistics through several projects:

- *Research Library Statistics, 1907/08 through 1987/88,* was completed and distributed to members in July. The compilation of historical data for ARL libraries in machine-readable form was managed by Office staff and the ARL Statistics Committee working with Kendon Stubbs of the University of Virginia. It will become a product of permanent value for longitudinal and cross-institutional comparisons.

- *ARL Statistics* [annual editions]: Kendon Stubbs is finishing data verification and documentation to make available annual ARL statistical data in machine-readable form; members and subscribers will have the option to receive diskettes as well as printed copies.

- A twelve-year machine-readable file of statistics on law and medical libraries is in preparation and should be available later this fall. Differences in variables collected by the Association of Academic Health Science Library Directors and the American Bar Association have made these data complicated to issue in formats consistent with other ARL statistics. Efforts are tentatively in place to collect law and medical library data annually from these groups, which will then be distributed together with annual ARL data. The separate historical and annual compilations should allow disaggregation, and thus more comparisons of "general" library data.

- Following up on a report by Jean Loup, University of Michigan and an ARL Visiting Program Officer in residence during 1989-90, the ARL Statistics Committee will implement suggestions for redefinitions and reformatting of the annual report on library expenditures as a percentage of university expenditures. Ms. Loup's study revealed that, although there are some controversies and problems with the data, they are still seen as useful to the membership. The Committee will continue to look at the issue of better definitions for expenditures and at the ways such figures are used in higher education administration.

- Beth Shapiro, as an ARL Visiting Program Officer based at Michigan State University, submitted a report to the Statistics Committee on access measures that might be incorporated into the ARL Statistics. The Committee held a special meeting at the ARL offices in August to discuss the report and other elements of the Mellon projects noted above. The Committee agreed to begin asking questions in areas related to public services as part of the supplemental statistics questionnaire in 1991, and to continue to look at a possible multi-year "inventory" of other institutional characteristics that reflect access to library services.

NEH Preservation Project. The National Endowment for the Humanities awarded $146,000 to the Office of Management Services in 1988 to further preservation planning in research libraries. The grant supports the participation of ten ARL member libraries in the Office's Preservation Planning Program (PPP), the training of preservation specialists to serve as consultants on the PPP, and a formal evaluation of the PPP by Margaret Child. The libraries at Colorado, Duke, Oklahoma State and Syracuse have completed the PPP as part of this project; studies are underway at Arizona, Boston Public, Delaware, Georgia, Kentucky and Purdue. The evaluation of the project has been conducted, and the report will be discussed by the project advisory committee at its October meeting. It is anticipated that the review will lead to efforts to develop support for the revision of the program as well as for the development of additional preservation resources for academic and research libraries.

HEA Title II-C Project. The H. W. Wilson Foundation awarded ARL a grant of $4,600 in support of a project to review the results of the first decade of the Higher Education Act Title II-C program. ARL Visiting Program Officer Samuel Streit of Brown University carried out the study and the report is currently out for review. An executive summary and full report will be published late this year or early in 1991.

National Register of Microform Masters (NRMM) Recon Project. ARL, in partnership with the Library of Congress, has selected OCLC - Online Computer Library Center, Inc. as the contractor for the continuation of the National Register of Microform Masters (NRMM) Recon Project. The goal of the project is the conversion into machine-readable records of the 400,000 monographic reports in the NRMM that remain to be converted. The NRMM Recon Project is made possible with funds from the National Endowment for the Humanities and the Andrew W. Mellon Foundation.

The first tapes were loaded this summer. During the next 13 months, OCLC will convert approximately 258,000 bibliographic records, 30% of them not previously in machine-readable form. OCLC will convert records to full USMARC format using RETROCON, OCLC's customized online retrospective conversion service. On behalf of research libraries, OCLC is making an $0.80 in-kind contribution to the price of each processed record. Staff in LC's Catalog Management and Publication Division will review converted records to ensure that they conform to the technical specifications established by ARL and LC. As the project proceeds, LC's Cataloging Distribution Service (CDS) will distribute tapes containing the converted records on a subscription basis.

North American Collections Inventory Project (NCIP). The North American Collections Inventory Project (NCIP) is operating on a cost recovery basis, providing training services and publications on-demand. ARL and RLG continue to cooperate on the development and revision of Conspectus materials and ARL is represented by Karin Wittenborg from the University of California, Los Angeles, on the RLG Sub-Committee on the Conspectus. Future activities include the publication of *NCIP News*, the distribution of a microcomputer-based Conspectus system developed at the University of North Carolina, and consideration of possible cooperative uses of the Conspectus in the areas of collection development and preservation. ARL participated in a meeting during IFLA in August on possible cooperative activities aimed at the internationalization of the Conspectus.

Guidelines for Bibliographic Records for Preservation Microform Masters. At its July 1990 meeting, the ARL Board of Directors endorsed the Guidelines for Bibliographic Records for Preservation Microform Masters (Serials). These guidelines complement the previously completed monograph guidelines. Crystal Graham, Latin American Studies Cataloger at the University of California, Sad Diego and ARL Visiting Program Officer prepared the serial guidelines for the ARL Committee of Bibliographic Control. The monograph and serials guidelines have now been incorporated into one document. The combined version of the Guidelines has been distributed to the ARL membership. The guidelines define a minimum, standardized set of data elements that must be present in a national preservation record for archival, first-generation microreproductions of books and serials. Taken together, the guidelines aim to achieve the standardization that is the preeminent requirement for a comprehensive system of bibliographic control for national preservation efforts.

Preservation Program Models Project. The H. W. Wilson Foundation has awarded $9,800 to ARL for the development of descriptive models of preservation programs in academic libraries. The project, developed by the ARL Committee on Preservation of Research Library Materials, is designed to make available descriptive and quantitative information regarding preservation staffing, preservation program components, and preservation expenditures in ARL libraries. Benchmarks and statistical profiles will be defined for differing levels of preservation program development. The project is being carried out by three preservation management specialists: Jan Merrill-Oldham, University of Connecticut; Carolyn Clark Morrow, Harvard University; and Mark Roosa, University of Delaware. Three members of the ARL Committee on Preservation of Research Library Materials are serving as the project's advisory committee: Carole Moore, University of Toronto; Scott Bennett, Johns Hopkins University; and William Studer, Ohio State University. Patricia McClung is liaison from the Research Libraries Group. The results of the project will be published in late 1990.

Visiting Program Officer Project. The ARL Visiting Program Officer Program has led to several projects. In addition to those already mentioned, recent participants are:

- Karen Turko, Head, Preservation Services, University of Toronto Libraries has completed the report *Mass Deacidification Systems: Planning and Managerial Decision-Making*. The report outlines key characteristics of deacidification systems, discusses issues related to selection of library materials for treatment, identifies operational requirements, and outlines financial considerations. The process of incorporating mass deacidification into ongoing library preservation operations affects not only the preservation program, but library operations as a whole. Ms. Turko's report focuses on the policy issues that need to be addressed in the implementation of mass deacidification programs.

- Christine Crocker is working with the Office of Management Services training and publications programs from August through October, 1990, on a Fulbright grant. Ms. Crocker, originally from Deakins University in Australia, will be director of the library at the University of Tasmania upon her return. She will continue to provide training to Australian librarians through her work with the Australian Information Management Association.

XIII. Coalition for Networked Information (CNI)

The Coalition for Networked Information was formed by ARL, CAUSE, and EDUCOM, in March 1990 to explore the promise of high performance computers and advanced networks for enriching scholarship and enhancing intellectual productivity. Its specific purpose is to promote the provision of information resources and services on existing telecommunications networks and on proposed interconnected networks. The linkage of research libraries to these networks and, therefore, to each other and their respective constituencies, is the immediate goal of ARL in establishing this capability. The long-term goal is to increase the influence of research libraries in technological and institutional change processes attendant to modern information architectures, infrastructures, and services. The development of this coalition was a priority of the Technology and Access capability for 1990.

Membership. A total of one hundred and fourteen institutions and organizations are now members of the Coalition. The spectacular growth of the Coalition, nearly four times faster in its first year than the original business plan, provides a clear indication of the interest of a broad range of research and education institutions and organizations in making full and effective use of networked information resources. Membership in CNI is open to all research and education institutions and organizations that are willing and able to pay its assessed dues, to engage actively in its program of work, and to be governed by ARL, CAUSE, and EDUCOM. These rules enable membership not only by research institutions per se, such as those that make up the membership of ARL, but by other types of research and education, even commercial, institutions and organizations as well. Members in these latter categories include the Maricopa Community College District, the New York Public Library, the Boston Public Library, the state libraries of Connecticut, New York, and Pennsylvania, OCLC, the Research Libraries Group, the Western Library Network, the CTW Library Consortium, the Florida Center for Library

Automation, the Ohio Library and Information System, the Triangle Research Libraries Network, Elsevier Science Publishers, NYSERNet, and, of course, the Coalition's sponsors Apple Computer, Digital Equipment Corporation, International Business Machines, and Xerox.

Organizational Meeting. Just under 130 people from nearly seventy-five institutions and organizations attended the successful organizational meeting of the Coalition Task Force on June 5th and 6th in Washington, D.C. Fifty-three percent of the attendees were librarians, thirty-four percent were information technologists, and thirteen percent were general administrators of one type or another. The audience heard and discussed a vision statement on university-based publishing, prepared by Jerome Yavarkovsky, Director of the New York State Library, and "challenge" presentations on each of the program themes identified by the Coalition Steering Committee: incentives and disincentives in research and education communication; architectures and infrastructures for networked information services; information exchange among projects that seek to advance the state of the art; environments for testing and evaluating service and product innovations; codes, policies, and practices that clarify rights and duties; and, professional and user education for effective access to, and management of, networked information. The meeting provided an excellent opportunity for members of the Coalition Task Force to set the terms of reference by which the CNI Steering Committee would conceptualize the Coalition's program, and to have a spirited exchange of information about experiences, concerns, and aspirations.

Strategy formulation. The Coalition Executives and members of the Coalition Steering Committee spent the summer in an intensive series of meetings and communications devoted to the formulation of the CNI program strategy, and the translation of that strategy into a design for the Fall 1990 Meeting of the Coalition Task Force. Four goals and objectives for the Coalition have been identified as a result of those deliberations:

- to *inspire*, by promulgating vision statements that project the future characteristics and capabilities of high performance computers and advanced networks, and that analyze those characteristics and capabilities in terms of their likely impacts, both positive and negative, on research and education communication;
- to *inform*, by identifying, endorsing, supporting, and coordinating projects that are collaborative, that seek to advance the understanding of or the state-of-the-art relative to the vision statements, that recognize the need for open architectures and standards, and that fully disclose their objectives, methods, and findings;
- to *influence*, by advocating principles, guidelines, and positions that address the behavioral, social, cultural, and economic processes and structures that both enable and constrain the use of high performance computers and advanced networks as infrastructures for research and educational communication; and,
- to *integrate*, by providing opportunities for senior administrators of libraries and senior administrators of information technologies in higher education institutions to work with their counterparts from other institutions and organizations in a common enterprise directed toward a shared future.

Working Groups established. To focus member participation in the pursuit of the Coalition's mission, goals, and objectives, seven Working Groups have been formed and allocated budgets in an effort to accomplish immediate results in each Group's assigned topical area. They are charged with preparing multi- (three to five) year views of trends affecting and needs emerging in those areas, and translating those views into FY92 action plans that, among other things, propose conferences and meetings that the Coalition should organize and stage, vision statements and positions the Coalition should formulate and promulgate, and projects and capacities the Coalition should enable and facilitate. The new Working Groups are:

- Non-commercial publishing;
- Commercial publishing;
- Architectures and standards;
- Legislation, codes, policies, and practices;
- Directories and resource information services;
- Teaching and learning; and,
- Management and professional and user education.

Fall, 1990, CNI Task Force Meeting. This meeting will be held in Washington, DC at the Loews L'Enfant Plaza Hotel from 7 p.m. on Saturday, November 3, through 12 noon on Monday, November 5. Some of the key elements of this meeting will be: at least one provocative vision statement; a discussion of the program strategy, and overviews of the terms of reference and general program of work of each of the seven Working Groups; informative reports on a small number of noteworthy projects; an opportunity for participants to interact informally about projects and ideas of their own choosing; and an outline of next steps and timetables.

Priorities for the first half of 1991. The Coalition's two major priorities for the October, 1990 through May, 1991, period are to ensure of the success of its seven new Working Groups, as one means to channel the resources and talents of the members of the Coalition Task Force, and to establish effective and mutually beneficial relationships with projects that advance the understanding of, or the state of the art relative to, the mission and visions of the Coalition. This period will also see important improvements in the organization of the Coalition's secretariat through the recruitment of a full-time assistant director to concentrate on Coalition membership services and communication strategies, and the installation of the CNI Internet server with the consequent establishment of files and information services to support Coalition activities. Finally, this will be a relatively busy and significant period for speaking engagements at conferences and attendance at various meetings (almost twenty such events have already been scheduled), as the CNI secretariat seeks to cultivate understanding of and build support for the Coalition and its purposes.

compiled September 28, 1990

APPENDIX B

117TH ARL MEMBERSHIP MEETING

ATTENDANCE

Members:

University of Alabama	[not represented]
University of Alberta	Ingles, Ernie
University of Arizona	Phipps, Shelley
Arizona State University	Riggs, Donald
Boston Public Library	Curley, Arthur
Boston University	Laucus, John
Brigham Young Univ.	Albrecht, Sterling
Univ. of British Columbia	Patrick, Ruth
Brown University	Taylor, Merrily
Univ. of Calif.-Berkeley	Rosenthal, Joseph
Univ. of Calif.-Davis	Sharrow, Marilyn
Univ. of Calif.-Irvine	Boyer, Calvin
Univ. of Calif.-Los Angeles	Werner, Gloria
Univ. of Calif.-Riverside	Thompson, James
Univ. of Calif.-San Diego	Gregor, Dorothy
Univ. of Calif.-Santa Barbara	Boissé, Joseph
Canada Inst. for Sci. & Tech. Information	Smith, Elmer
Case Western Reserve Univ.	Bingham, Karen
Center for Research Libs.	Simpson, Donald
University of Chicago	Runkle, Martin
University of Cincinnati	Thompson, Ann
University of Colorado	Williams, James
Colorado State University	Chambers, Joan
Columbia University	Sloan, Elaine
University of Connecticut	Stevens, Norman
Cornell University	Seznec, Alain
Dartmouth College	Otto, Margaret
University of Delaware	Brynteson, Susan
Duke University	Campbell, Jerry
Emory University	Gotwals, Joan
University of Florida	[not represented]
Florida State University	[not represented]

Georgetown University	Martin, Susan K.
University of Georgia	Potter, William
Georgia Inst. of Technology	Drake, Miriam
University of Guelph	Black, John
Harvard University	DeGennaro, Richard
University of Hawaii	[not represented]
University of Houston	Downes, Robin
Howard University	Randall, Ann
Univ. of Illinois, Chicago	Hogan, Sharon
Univ. of Illinois, Urbana	[not represented]
Indiana University	Neal, James
University of Iowa	Creth, Sheila
Iowa State University	Morris, Dilys
Johns Hopkins Univ.	Bennett, Scott
University of Kansas	Crowe, William
Kent State University	Tolliver, Don
University of Kentucky	Willis, Paul
Université Laval	Rusque, Claude
Library of Congress	Avram, Henriette
Linda Hall Library	Martin, Louis
Louisiana State University	Schneider, D.W.
University of Manitoba	[not represented]
University of Maryland	[not represented]
University of Massachusetts	[not represented]
Mass. Inst. of Technology	Lucker, Jay
McGill University	Ormsby, Eric
McMaster University	Hill, Graham
University of Miami	Rodgers, Frank
University of Michigan	Stoffle, Carla
Michigan State University	Davis, Hiram
University of Minnesota	Shaughnessy, Thomas
University of Missouri	Bowman, Martha
National Agric. Library	Howard, Joseph H.
National Lib. of Canada	Scott, Marianne
National Lib. of Medicine	Colaianni, Lois Ann
University of Nebraska	Hendrickson, Kent
University of New Mexico	Rollins, Stephen
New York Public Library	Fasana, Paul
New York State Library	Yavarkovsky, Jerome
New York University	Rochell, Carlton

Newberry Library	[not represented]
Univ. of North Carolina	Govan, James
North Carolina State Univ.	Nutter, Susan
Northwestern University	McGowan, John
University of Notre Dame	Miller, Robert
Ohio State University	Studer, William
University of Oklahoma	Lee, Sul
Oklahoma State Univ.	Johnson, Edward
University of Oregon	Shipman, George
Univ. of Pennsylvania	Mosher, Paul
Penn. State University	Cline, Nancy
University of Pittsburgh	Kobulnicky, Paul
Princeton University	Koepp, Donald
Purdue University	Mobley, Emily
Queen's University	[not represented]
Rice University	Shapiro, Beth
University of Rochester	Wyatt, James
Rutgers University	Euster, Joanne
Univ. of Saskatchewan	Wiens, Paul
Smithsonian Institution	Smith, Barbara J.
Univ. of South Carolina	Young, Arthur
Univ. of Southern California	Gilman, Nelson
Southern Illinois University	Peterson, Kenneth
Stanford University	[not represented]
SUNY-Albany	Butler, Meredith
SUNY-Buffalo	von Wahlde, Barbara
SUNY-Stony Brook	Smith, John
Syracuse University	Stam, David
Temple University	Myers, James
Univ. of Tennessee	Mitchell, Aubrey
University of Texas	Billings, Harold
Texas A&M	[not represented]
University of Toronto	Moore, Carole
Tulane University	Leinbach, Philip
University of Utah	Hanson, Roger
Vanderbilt University	Getz, Malcolm
University of Virginia	Stubbs, Kendon
Virginia Polytechnic Inst.	Gherman, Paul
Univ. of Washington	Bengtson, Betty
Washington State Univ.	McCool, Donna

Washington University	Baker, Shirley
Univ. of Waterloo	[not represented]
Wayne State University	Spyers-Duran, Peter
Univ. of Western Ontario	[not represented]
University of Wisconsin	Frazier, Kenneth
Yale University	Siggins, Jack
York University	Olshen, Toni

Guests:

ALA Washington Office	Henderson, Carol
American Assoc. for Advancement of Science	Morgan, Patricia
American Philosophical Society	Carter, Edward
Andrew Mellon Foundation	Cummings, Anthony
Andrew Mellon Foundation	Morris, James
Association of American Universities	Vaughn, John
Canadian Assoc. of Research Libraries	McCallum, David
CHE	Turner, Judith
CLR Intern - Brown University	Steel, Virginia
CLR Intern - Princeton University	Klingberg, Susan
CLR Intern - University of Chicago	Morrison, Margaret
Commission on Preservation and Access	Battin, Patricia
Computer Professionals for Social Resp.	Rotenberg, Marc
Corp. for National Research Initiatives	Cerf, Vinton
Council on Library Resources	Cummings, Martin
Council on Library Resources	Haas, Warren
Foundation Center	Buckman, Thomas
Harvard University	Morrow, Carolyn
Howard University	Wright, Arthuree
Library Journal	Quinn, Judy
Library of Congress	Zich, Robert
Library of Congress	Harris, Kenneth
Library of Congress	Sittig, William
NASA	Green, James
National Archives and Records Admin.	Weiher, Claudine
National Humanities Alliance	Hammer, John

National Security Archive	Ruthraufl, John
National Security Archives	Blanton, Tom
NEH Division of Research Programs	Ekman, Richard
NEH Office of Preservation	Farr, George
New York Public Library	Kordish, Heike
Northeast Consulting Resources, Inc.	Weber, Robert
OCLC	Smith, K. Wayne
Research Libraries Group	Michalko, James
Southern Illinois University Press	DeBacher, Richard
Special Libraries Assoc.	Hackl, Kathy Warye
SUNY-Binghamton	Wagner, Peter
U.S. Dept. of Education - Library Programs	Mathews, Anne
University of California	Lynch, Clifford
University of Chicago	Swanson, Patricia
University of Connecticut	McDonald, John P.
University of Connecticut	Merrill-Oldham, Jan
University of Massachusetts	Fretwell, Gordon

ARL Staff:

Asst. Exec. Director - Federal Rel. and Information Policy	Adler, Prudence
Visiting Program Officer	Crocker, Christine
Office Manager	Dikeos, Gary
Director, Office of Research and Development	Gardner, Jeffrey
OMS Trainer	Jennings, Kriza
Director, Office of Management Services	Jurow, Susan
Director, Office of Scientific and Academic Publishing	Okerson, Ann
Senior Program Officer for Technology/Director, Coalition for Networked Information	Peters, Paul
Senior Program Officer for Administration and Statistics	Pritchard, Sarah
Program Officer for Preservation and Bibliographic Control/Collection Development Specialist	Reed-Scott, Jutta
Executive Director	Webster, Duane
OMS Program Officer for Information Services	Welch, Brigid

NAME INDEX

Adler, Prudence	Asst. Exec. Director - Federal Rel. and Information Policy
Albrecht, Sterling	Brigham Young Univ.
Avram, Henriette	Library of Congress
Baker, Shirley	Washington University
Battin, Patricia	Commission on Preservation and Access
Bengtson, Betty	Univ. of Washington
Bennett, Scott	Johns Hopkins University
Billings, Harold	University of Texas
Bingham, Karen	Case Western Reserve Univ.
Black, John	University of Guelph
Blanton, Tom	National Security Archives
Boissé, Joseph	Univ. of Calif.-Santa Barbara
Bowman, Martha	University of Missouri
Boyer, Calvin	Univ. of Calif.-Irvine
Brynteson, Susan	University of Delaware
Buckman, Thomas	Foundation Center
Butler, Meredith	SUNY-Albany
Campbell, Jerry	Duke University
Carter, Edward	American Philosophical Society
Cerf, Vinton	Corp. for National Research Initiatives
Chambers, Joan	Colorado State University
Cline, Nancy	Penn. State University
Colaianni, Lois Ann	National Lib. of Medicine
Creth, Sheila	University of Iowa
Crocker, Christine	Visiting Program Officer
Crowe, William	University of Kansas
Cummings, Anthony	Andrew Mellon Foundation
Cummings, Martin	Council on Library Resources
Curley, Arthur	Boston Public Library
Davis, Hiram	Michigan State University
DeBacher, Richard	Southern Illinois University Press
DeGennaro, Richard	Harvard University
Dikeos, Gary	Office Manager
Downes, Robin	University of Houston
Drake, Miriam	Georgia Inst. of Technology
Ekman, Richard	NEH Division of Research Programs
Euster, Joanne	Rutgers University

Farr, George	NEH Office of Preservation
Fasana, Paul	New York Public Library
Frazier, Kenneth	University of Wisconsin
Fretwell, Gordon	University of Massachusetts
Gardner, Jeffrey	Director, Office of Research. and Dev.
Getz, Malcolm	Vanderbilt University
Gherman, Paul	Virginia Polytechnic Inst.
Gilman, Nelson	Univ. of Southern California
Gotwals, Joan	Emory University
Govan, James	Univ. of North Carolina
Gregor, Dorothy	Univ. of Calif.-San Diego
Haas, Warren	Council on Library Resources
Hackl, Kathy Warye	Special Libraries Assoc.
Hammer, John	National Humanities Alliance
Hanson, Roger	University of Utah
Harrar, Joanne	University of Maryland
Harris, Kenneth	Library of Congress
Henderson, Carol	ALA Washington Office
Hendrickson, Kent	University of Nebraska
Hill, Graham	McMaster University
Hogan, Sharon	Univ. of Illinois, Chicago
Howard, Joseph H.	National Agric. Library
Ingles, Ernie	University of Alberta
Jennings, Kriza	OMS Trainer
Johnson, Edward	Oklahoma State Univ.
Jurow, Susan	Director, Office of Management Services
Klingberg, Susan	CLR Intern - Princeton University
Kobulnicky, Paul	University of Pittsburgh
Koepp, Donald	Princeton University
Laucus, John	Boston University
Lee, Sul	University of Oklahoma
Leinbach, Philip	Tulane University
Lucker, Jay	Mass. Inst. of Technology
Martin, Louis	Linda Hall Library
Martin, Susan K.	Georgetown University
Mathews, Anne	U.S. Dept. of Ed. - Library Programs
McCallum, David	Canadian Assoc. of Research Libraries
McCool, Donna	Washington State Univ.
McGowan, John	Northwestern University
Merrill-Oldham, Jan	University of Connecticut

Michalko, James	Research Libraries Group
Miller, Robert	University of Notre Dame
Mitchell, Aubrey	Univ. of Tennessee
Mobley, Emily	Purdue University
Moore, Carole	University of Toronto
Morgan, Patricia	American Assoc. for Advancement of Science
Morris, Dilys	Iowa State University
Morris, James	Andrew Mellon Foundation
Morrison, Margaret	CLR Intern - University of Chicago
Mosher, Paul	Univ. of Pennsylvania
Myers, James	Temple University
Neal, James	Indiana University
Nutter, Susan	North Carolina State Univ.
Okerson, Ann	Director, Office of Scientific and Academic Publishing
Olshen, Toni	York University
Ormsby, Eric	McGill University
Otto, Margaret	Dartmouth College
Patrick, Ruth	Univ. of British Columbia
Peters, Paul	Senior Program Officer for Technology/Director, Coalition for Networked Information
Peterson, Kenneth	Southern Illinois University
Phipps, Shelley	University of Arizona
Potter, William	University of Georgia
Pritchard, Sarah	Senior Program Officer for Administration and Statistics
Quinn, Judy	Library Journal
Randall, Ann	Howard University
Reed-Scott, Jutta	Program Officer for Preservation and Bibliographic Control /Collection Development Specialist
Riggs, Donald	Arizona State University
Rochell, Carlton	New York University
Rodgers, Frank	University of Miami
Rollins, Stephen	University of New Mexico
Rosenthal, Joseph	Univ. of Calif.-Berkeley
Rotenberg, Marc	Computer Professionals for Social Resp.
Runkle, Martin	University of Chicago
Rusque, Claude	Université Laval
Schneider, D.W.	Louisiana State University

Scott, Marianne	National Lib. of Canada
Seznec, Alain	Cornell University
Shapiro, Beth	Rice University
Sharrow, Marilyn	Univ. of Calif.-Davis
Shaughnessy, Thomas	University of Minnesota
Shipman, George	University of Oregon
Siggins, Jack	Yale University
Simpson, Donald	Center for Research Libs.
Sittig, William	Library of Congress
Sloan, Elaine	Columbia University
Smith, Barbara J.	Smithsonian Institution
Smith, Elmer	Canada Inst. for Sci. & Tech. Information
Smith, John	SUNY-Stony Brook
Smith, K. Wayne	OCLC
Spyers-Duran, Peter	Wayne State University
Stam, David	Syracuse University
Steel, Virginia	CLR Intern - Brown University
Stevens, Norman	University of Connecticut
Stoffle, Carla	University of Michigan
Stubbs, Kendon	University of Virginia
Studer, William	Ohio State University
Swanson, Patricia	University of Chicago
Taylor, Merrily	Brown University
Thompson, Ann	University of Cincinnati
Thompson, James	Univ. of Calif.-Riverside
Tolliver, Don	Kent State University
Vaughn, John	Association of American Universities
von Wahlde, Barbara	SUNY-Buffalo
Wagner, Peter	SUNY-Binghamton
Weber, Robert	Northeast Consulting Resources, Inc.
Webster, Duane	Executive Director
Weiher, Claudine	National Archives and Records Admin.
Welch, Brigid	OMS Program Officer for Info. Services
Werner, Gloria	Univ. of Calif.-Los Angeles
Wiens, Paul	Univ. of Saskatchewan
Williams, James	University of Colorado
Willis, Paul	University of Kentucky
Wyatt, James	University of Rochester
Yavarkovsky, Jerome	New York State Library
Young, Arthur	Univ. of South Carolina

APPENDIX C

OFFICERS, BOARD OF DIRECTORS, COMMITTEES, AND TASK FORCES

ARL Officers and Board for 1990

Martin Runkle	President
Marilyn J. Sharrow	Vice President & President Elect
Charles E. Miller	Past President
Harold W. Billings	(Oct. 1989 - Oct. 1992)
Arthur Curley	(Oct. 1989 - Oct. 1992)
D. Kaye Gapen	(Oct. 1987 - Oct. 1990)
Ellen Hoffmann	(Oct. 1988 - Oct. 1991)
Susan K. Nutter	(Oct. 1989 - Oct. 1992)
Charles B. Osburn	(Oct. 1988 - Oct. 1991)
Carlton C. Rochell	(Oct. 1987 - Oct. 1990)
Thomas W. Shaughnessy	(Oct. 1988 - Oct. 1991)

Standing Committees and Task Forces

(Committee terms are based on calendar year)

Committee on Government Policies
Joseph A. Boissé (1990-92)
Susan Brynteson (1989-91)
Paul Gherman (1988-90)
John R. Haak (1989-91)
Ellen Hoffman (1989-91)
Paula T. Kaufman (1990-92)
Louis E. Martin (1990-92)
Alain Seznec (1990-92)
Paul A. Willis (1989-91)
James F. Wyatt (1990-92)
Merrily E. Taylor (1989-91), Chair (1989-90)

Staff: Prue Adler

Committee on Collection Development
Harold W. Billings (1990-92)
John Laucus (1989-91)
Paul H. Mosher (1989-91)
Charles B. Osburn (1989-90)
William Sittig, Library of Congress Liaison
Barbara J. Smith (1990-92)
James C. Thompson (1989-91)
Paul Wiens (1989-91)
Susan K. Nutter (1988-90), Chair (1989-90)

Staff: Jeffrey Gardner

Committee on Nominations 1990
Sterling J. Albrecht
Nancy Cline
Marilyn J. Sharrow, Chair (1989-90)

Committee on the Management of Research Library Resources
John Black (1988-90)
Meredith Butler (1990-92)
Jerry D. Campbell (1989-91)
Sheila Creth (1988-90)
Joanne R. Euster (1989-91)
Arthur Curley (1989-91)
Edward R. Johnson (1990-92)
Donald Riggs (1990-92)
Thomas W. Shaughnessy (ex officio as Chair of Committee on ARL Statistics)
Jerome Yavarkovsky (1989-91)
Sul H. Lee, Chair (1989-90)

Staff: Susan Jurow

Committee on Preservation of Research Library Materials

Henriette Avram, Library of Congress Liaison
Scott Bennett (1990-92)
Donald W. Koepp (1988-90)
Jan Merrill-Oldham, Consultant (1990)
Joseph A. Rosenthal (1990-92)
George W. Shipman (1989-91)
Donald B. Simpson (1989-90)
David C. Weber (1989-91)
William J. Studer, Vice Chair (1989-90)
Carole Moore (1987-90), Chair (1989-90)

Staff: Jutta Reed-Scott

Committee on Bibliographic Control

Henriette Avram, Library of Congress Liaison
Shirley R. Baker (1990-92)
Calvin J. Boyer (1989-91)
Nancy L. Eaton (1990-92)
Paul Fasana (1988-90)
Jay K. Lucker (1988-90)
Carlton C. Rochell (1989-91)
Marianne Scott (1989-91)
Barbara von Wahlde (1989-91)
Dorothy Gregor (1987-90), Chair (1989-90)

Staff: Jutta Reed-Scott

Committee on ARL Statistics

Roger K. Hanson (1990-92)
Kent Hendrickson (1989-91)
Graham R. Hill (1989-91)
Irene B. Hoadley (1990-92)
Gordon Fretwell, Consultant (1990)
Margaret A. Otto (1990-92)
Kendon Stubbs (Consultant)
Thomas Shaughnessy, Chair (1989-90)

Staff: Sarah Pritchard

Task Force on Telecommunications

John Black
D. Kaye Gapen
Malcolm Getz
Paul Gherman
James F. Williams II
Nancy Cline, Chair

Staff: Prue Adler

Advisory Committee

Supporting Preservation Planning in Research Libraries
Jay K. Lucker
Carolyn Morrow, Harvard University
Margaret A. Otto
John B. Smith
David C. Weber

Representatives

Commission on Preservation and Access, Advisory Committee	William J. Studer
American Council of Learned Societies	D. Webster
Association of American Universities	D. Webster/P. Adler
Association of American University Presses	D. Webster
CAUSE (College and University Systems Exchange)	P. Adler
Coalition on Government Information	P. Adler
CONSER Advisory Group	Susan Brynteson
Council on Library Resources, Grants Committee	D. Webster
EDUCOM	D. Webster/P. Adler
Eighteenth-Century Short Title Catalogue	Ray Frantz
IFLA Voting Representative	D. Webster/P. Adler
LC Network Advisory Committee	D. Webster/P. Adler
National Humanities Alliance	D. Webster
National Information Standards Organization (NISO)	H. Joanne Harrar
National Information Standards Organization, Voting Rep.	D. Webster/J. Reed-Scott
National Institute of Conservators	David H. Stam
RLG Subcommittee on the Conspectus	George Soete, UC/San Diego
Society of American Archivists	Herbert Finch, Cornell
Society for Scholarly Publishing	A. Okerson

APPENDIX D

MEMBERSHIP OF THE ASSOCIATION

University of Alabama Libraries
Tuscaloosa, Alabama 35487-0266
Charles B. Osburn
Dean
(205) 348-7561

University of Alberta Library
Edmonton, Alberta Canada T6G 2J8
Ernie Ingles
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(403) 492-5569

University of Arizona Library
Tucson, Arizona 85721
Shelley Phipps
Acting Librarian
(602) 621-2101

Arizona State University Library
Tempe, Arizona 85287
Donald Riggs
Dean of University Libraries
(602) 965-3417

Boston University Library
Boston, Massachusetts 02215
John Laucus
Director
(617) 353-3710

Boston Public Library
Boston, Massachusetts 02117
Arthur Curley
Librarian
(617) 536-5400

Brigham Young University Library
Provo, Utah 84602
Sterling J. Albrecht
University Librarian
(801) 378-2905

University of British Columbia Library
Vancouver, B.C. Canada V6T 1Y3
Ruth Patrick
University Librarian
(604) 228-2298

Brown University Library
Providence, Rhode Island 02912
Merrily Taylor
University Librarian
(401) 863-2162

University of California-Berkeley
Berkeley, California 94720
Joseph A. Rosenthal
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(415) 642-3773

University of California-Davis
Davis, California 95616-5292
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(916) 752-2110

University of California-Irvine
Irvine, California 92713
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(714) 856-5212

University of California-Los Angeles
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Riverside, California 92517
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(805) 893-3256

Canada Institute for Scientific & Technical Information
Ottawa, Ontario Canada K1A 0S2
Elmer V. Smith
Director
(613) 993-2341

Case Western Reserve University Libraries
Cleveland, Ohio 44106
Karen H. Bingham
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(216) 368-2990

Center for Research Libraries
Chicago, Illinois 60637
Donald B. Simpson
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1-800 621-6044 or (312) 955-4339

University of Chicago Library
Chicago, Illinois 60637-1502
Martin Runkle
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Cincinnati, Ohio 45221-0033
Ann Thompson
Acting Dean and University Librarian
(513) 556-1515

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Colorado State University Library
Fort Collins, Colorado 80523
Joan Chambers
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Norman D. Stevens
Director
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Ithaca, New York 14850
Alain Seznec
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(607) 255-3689

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Margaret A. Otto
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603) 646-2235

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Newark, Delaware 19717-5267
Susan Brynteson
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Tallahassee, Florida 32306
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Susan K. Martin
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(202) 687-7425

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Athens, Georgia 30602
William G. Potter
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(404) 542-0621

Georgia Institute of Technology
Atlanta, Georgia 30332
Miriam Drake
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(519) 824-4120

Harvard University Library
Cambridge, Massachusetts 02138
Sidney Verba
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University of Hawaii Library
Honolulu, Hawaii 96822
John R. Haak
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(808) 956-7205

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Houston, Texas 77204-2091
Robin Downes
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Howard University Libraries
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Ann K. Randall
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(202) 806-7234

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Chicago, Illinois 60680
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(312) 996-2716

University of Illinois Library at Urbana
Urbana, Illinois 61801
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(217) 333-0790

Indiana University Libraries
Bloomington, Indiana 47405
James G. Neal
Dean of University Libraries
(812) 855-3404

University of Iowa Libraries
Iowa City, Iowa 52242
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(319) 335-5868

Iowa State University Library
Ames, Iowa 50011
Nancy L. Eaton
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(515) 294-1442

Johns Hopkins University Library
Baltimore, Maryland 21218
Scott Bennett
Director
(301) 338-8325

University of Kansas Libraries
Lawrence, Kansas 66045-2800
William J. Crowe
Dean of Libraries
(913) 864-3601

Kent State University Libraries
Kent, Ohio 44242
Don Tolliver
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(216) 672-2962

University of Kentucky Libraries
Lexington, Kentucky 40506
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(606) 257-3801

Laval University Library
Québec, (Québec) Canada G1K 7P4
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(418) 656-3451

Library of Congress
Washington, D.C. 20540
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(202) 707-5205

Linda Hall Library
Kansas City, Missouri 64110
Louis E. Martin
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816) 363-4600

Louisiana State University Library
Baton Rouge, Louisiana 70803
D. W. Schneider
Interim Director
(504) 388-2217

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Montreal, Quebec Canada H3A 1Y1
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(514) 398-4677

McMaster University Library
Hamilton, Ontario Canada L8S 4L6
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(416) 525-9140 Local 4359

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(204) 474-8749

University of Maryland Libraries
College Park, Maryland 20742
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University of Miami Library
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East Lansing, Michigan 48824
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University of Minnesota Libraries
Minneapolis, Minnesota 55455
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(612) 624-4520

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(314) 882-4701

National Agricultural Library
Beltsville, Maryland 20705
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(301) 344-4248

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(613) 996-1623

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Bethesda, Maryland 20894
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Lincoln, Nebraska 68588-0410
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Albuquerque, New Mexico 87131
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New York Public Library
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Albany, New York 12230
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(518) 473-1189

New York University Libraries
New York, New York 10012
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Princeton, New Jersey 08540
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Carbondale, Illinois 62901
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Stanford, California 94305
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Albany, New York 12222
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Stony Brook, New York 11794
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Syracuse, New York 13244-2010
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Director
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College Station, Texas 77843
Irene B. Hoadley
Director
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Toronto, Ontario Canada M5S 1A5
Carole Moore
Chief Librarian
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New Orleans, Louisiana 70118
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Librarian
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Salt Lake City, Utah 84112
Roger K. Hanson
Director
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Nashville, Tennessee 37203
Malcolm Getz
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Ray Frantz Jr.
Librarian
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Blacksburg, Virginia 24061
Paul Gherman
Director of Libraries
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